REACTION PRODUCTS
RICHMOND, CALIFORNIA

DRAFT REMOVAL ACTION WORKPLAN
APPROVAL RECORD

	5/11/2006
Project Manager, Coastal Cleanup Operations	**Date**
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Unit Chief, Coastal Cleanup Operations	**Date**
	5/30/06
Branch Chief, Coastal Cleanup Operations	**Date**

DRAFT

REMOVAL ACTION WORKPLAN
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

Prepared for

REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

Prepared by

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CSS PROJECT NO: 6103

May 2006

DRAFT

REMOVAL ACTION WORKPLAN

For the Reaction Products, Inc. Property
840 Morton Avenue
Richmond, California

DTSC Docket No. I/SE 99/00-005

May 2006

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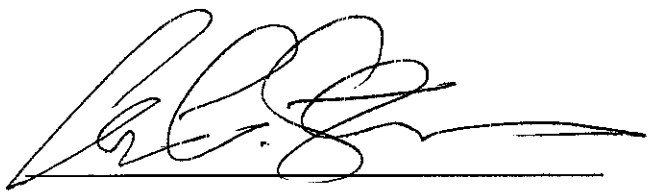

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Abbreviations and Acronyms

bgs	below ground surface
Cal/EPA	California Environmental Protection Agency
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPCs	chemicals of potential concern
1,1-DCA	1,1-Dichloroethane
1,2-DCA	1,2-Dichloroethane
1,1-DCE	1,1-Dicholoroethene
cis-1,2-DCE	cis-1,2-Dichloroethene
DOT	Department of Transportation
DTSC	California Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
HHRA	Human Health Risk Assessment
HRC/BIO	Hydrogen Releasing Compound with Bio-Inoculum
HSP	Health and Safety Plan
mg/kg	Milligrams per kilogram
mg/l	Milligrams per liter
msl	mean sea level
OSHA	Occupational Safety and Health Administration
PEA	Preliminary Endangerment Assessment
PID	Photoionization detector
PPE	personal protective equipment
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
RAOs	Removal Action Objectives
RAW	Removal Action Workplan
RCRA	Resource Conservation and Recovery Act
RI/BRA	Remedial Investigation and Baseline Risk Assessment
RPI	Reaction Products Incorporated
RWQCB	Regional Water Quality Control Board
SF	San Francisco
STLC	soluble threshold limit concentration
TCE	Trichloroethylene or Trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids

Abbreviations and Acronyms (continued)

UCL	upper confidence limit
USA	Underground Service Alert
UST(s)	Underground storage tank(s)
VOC	Volatile organic compound
VC	Vinyl Chloride
µg/L	micrograms per liter

Executive Summary

This *Removal Action Workplan* (RAW) was prepared by CSS Environmental Services, Inc., for the California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC) The RAW evaluates the following three remedial options for remediation of the VOC-impacted groundwater at the site: 1) no action, 2) injection of a hydrogen releasing compound with bio-inoculum (HRC/BIO), and 3) a groundwater pump and treat system (GPT); and the preferred alternative is injection of a hydrogen releasing compound with bio-inoculum (HRC/BIO). This RAW presents the selected methodology that will be employed at the Reaction Products, Inc (RPI) site to reduce onsite and offsite groundwater contamination to drinking water standards.

RPI is a 3-acre lot located at 840 Morton Avenue in Richmond, California, in a mixed industrial/residential neighborhood, and is bounded by the Union Pacific Railroad (railroad) and the undeveloped Breuner property beyond to the west, Morton Avenue to the north, and on the east and south by the former Witco Argus Corporation property (Witco site), currently known as Chemtura Corporation. A residential community of approximately 2,500 people, Parchester Village, is located adjacent to and north of Morton Avenue. The regional location map and site plan for the subject facility area presented as Figure 1 and Figure 2, respectively

RPI has operated the subject site from 1959-present. The present site was undeveloped prior to its use by RPI. RPI historically and currently mixes and distributes water treatment chemical products. More recently, RPI mixes and distributes waterproofing resins and urethane plastics. Current use of the site is limited to RPI manufacturing processes. Most RPI operations have been performed on the eastern portion of the site, although a small storage building and loading dock were constructed next to a rail spur on the western portion of the property Transfer and storage of raw materials and products occurred in the warehouse. All mixing operations took place on the eastern portion of the site.

Groundwater investigation near the site began in 1983 with the installation of eight monitoring wells around and upgradient of two former surface impoundments on the adjacent Witco (now Chemtura) property. The surface impoundments were closed in 1986. The groundwater was analyzed for general chemistry parameters, pH, specific conductance, total organic carbon (TOC) and total organic halogens (TOX). Low (background) levels of metals were detected, pH ranged from 5.5 to 11.7 near an

impoundment (6.0 to 6.8 in other areas), specific conductance ranged from 2,090 micromhos/cm to 30,000 umhos/cm (higher readings downgradient of surface impoundments), TOC ranged from 3 milligrams per liter (mg/l) to 3,200 mg/l (higher near the surface impoundments), and TOX ranged from non-detect (ND) to 6 8 mg/l (higher near the surface impoundments). Additional monitoring wells were installed in 1984 and 1985, some of which were installed on the Reaction Products property. In 1987, groundwater from well W-22, located near the northwestern corner of the Reaction Products property, contained trichloroethylene (TCE) at 3,400 micrograms per liter (ug/l), trans-1,2-dichloroethylene (trans-1,2-DCE) at 1,100 ug/l, dichloroethane (DCA) at 770 ug/l, dichloroethylene (DCE) at 280 ug/l, and trichloroethane (TCA) at 130 ug/l A soil source removal action (excavation) was previously performed by others near W-22 to remove soil impacted from an underground petroleum pipeline release, believed to be the result of the pipeline being struck during drilling operations for the W-22's construction, performed by a consultant to Witco (now Chemtura). The aromatic volatile organic compounds (VOCs), benzene and toluene are present in groundwater at W-22.

Remedial investigations performed at the RPI property since 1983 detected significant concentrations of VOCs in soil and groundwater, primarily trichloroethylene (TCE), 1,1-dichloroethene (1,1-DCE) and 1,2 dichloroethane (1,2-DCA) TCE was detected in soil at a concentration as high as 2,900 parts per million (ppm) at a depth of 8.5 feet in the vicinity of the rail spur. A soil removal action was performed in April 1998 to remove the TCE impacted soil. Approximately 250 cubic yards of TCE impacted soil were excavated and treated onsite. Confirmation sampling results indicated that no further soil remedial actions are required at the site.

TCE and 1,1-DCE were detected at elevated concentrations in groundwater at the site near the northwestern corner of the property near the loading dock, small storage building and rail spur. TCE and 1,1-DCE were detected as high as 53,000 micrograms per liter (µg/l) and 10,000 µg/l, respectively, in the lower aquifer, encountered between 30 and 45 feet below ground surface. Concentrations of TCE and 1,1-DCE were found at 410 µg/l and 200 µg/l, respectively, in the shallow aquifer, encountered between 5 and 30 feet below ground surface. 1,2-DCA was found at 970 µg/l in the shallow aquifer at the northern site boundary. Vinyl chloride and benzene have been detected as high as 5.7 µg/l and 4.5 µg/l, respectively. This RAW evaluates and presents the selected methodology that will be employed to reduce onsite groundwater contamination to meet the remedial goals. Application of the selected technology to offsite groundwater contamination is presented as a contingency in the event that onsite remediation and

natural attenuation do not continue a current downward trend in offsite groundwater contaminant concentrations.

Multiple plumes of groundwater impacted by hazardous materials have been identified in the vicinity of the Site. Of primary concern, due to their concentration and toxicity, are halogenated volatile organic compounds (HVOCs) including trichloroethene (TCE), 1,1-dichloroethene (DCE), cis-1,2-dichloroethene (1,2-DCE), 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethane (1,2-DCA), 1,1,1-trichloroethane (TCA), vinyl chloride, and the aromatic volatile organic compounds (VOCs), benzene and toluene. These and various other constituents including tetramethyltetrahydrofuran (TMTHF) have been discovered in groundwater underlying the Site and vicinity sites by various environmental consultants and contractors since 1989. Please note that TMTHF has been previously identified and documented as a contaminant source associated with former processes conducted at the Witco (Chemtura) site.

The RAW evaluates several remedial options: no action, injection of a hydrogen releasing compound with bio-inoculum (HRC/BIO), and a groundwater pump and treat system (GPT). These alternatives were then compared using three criteria (effectiveness, implementability and cost). The preferred alternative is Alternative 2 (HRC with Bio-inoculum) because it reduces onsite VOC concerns using an enhanced in-situ biodegradation process and is easily implemented without requiring any removal or disposal activities of impacted groundwater. Implementation of the preferred alternative is expected to take 3 months for obtaining permits, contracting and scheduling the installation of borings and monitoring wells

The Administrative Record and References for this project may be found in Section 8. The California Environmental Quality Act (CEQA) Documentation and Responsiveness Summary can be found in Appendix E and Appendix F, respectively.

1.0 Introduction

This Removal Action Workplan (RAW) was prepared by CSS Environmental Services, Inc., (CSS) for Reaction Products, Inc. for submittal to the California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC). This RAW addresses proposed removal actions for chemicals of potential concern (COPCs) identified within shallow and lower groundwater aquifers at a suspected source area located near the western boundary of the Reaction Products site.

1.1 Site Description

The RPI site is located at 840 Morton Avenue in Richmond, California, and consists of approximately 3 acres in a mixed industrial/residential neighborhood (designated Richmond M-2, Light Industrial). The site is bounded by the Union Pacific Railroad (railroad) to the west, Morton Avenue to the north, and on the east and south by the former Witco Argus Corporation property (Witco site). A residential community of approximately 2,500 people, Parchester Village, is located adjacent to and north of Morton Avenue, located at the northern property boundary of the subject site. The site location map and site plan are presented as Figures 1 and 2, respectively.

1.1.1 Site Geology/Hydrology

The site lithology is illustrated by a composite section of boring and well logs presented as Figure 10 Location of Cross Section, and Figure 11 Cross Section A-A'. The general lithology of the site is comprised of fill from about 0 to 7-10 ft bgs underlain by unconsolidated interbedded sand, silt and organic clay. Two sandy water-bearing units have been previously identified, separated by a silty/clayey aquitard. The water table varies seasonally from an average depth of about 10 ft bgs. Generally, the shallow aquifer is unconfined or semi-confined and is first encountered between about 5 and 30 feet bgs and ranges in thickness from about 8 to 15 feet. The lower aquifer is confined or semi-confined, and is first encountered between about 30 and 45 feet bgs and ranges in thickness from 5 to 30 feet. In some areas these aquifers may merge and become one. The hydraulic conductivity (K) of the shallow aquifer has been estimated as 0 122 feet per day and K for the lower aquifer, also referred to as the "A" Zone, has been estimated

as 6.47 ft/day (IT Group's *Second Quarter 1999 Groundwater Monitoring and Sampling Report*, dated August 13, 1999).

Aquifer discontinuities or interconnections have not been established although it is believed that the two identified aquifers do interconnect at some point because some hazardous materials found underlying the site reside in both identified aquifers. During the implementation of an RPI field Remedial Investigation and Baseline Risk Assessment (RI/BRA) investigation in 2001-2002, the TDS concentrations in the two aquifers, however, were found to be considerably different. W38A, located in the lower aquifer, had a reported TDS concentration of 4,100 milligrams per liter (mg/l) and the highest TDS concentration was found in RP-15A, also completed in the lower aquifer, at 9,400 mg/l, as shown in Table 1. TDS concentrations measured in the shallow aquifer ranged from 360 to 2,100 mg/l, therefore, on the basis of TDS, the shallow aquifer would be considered a potential drinking water source.

The minimum water quality standard for ground waters of the State of California considered potentially suitable for drinking water supply, both municipal and domestic, as promulgated by the State Water Resources Control Board (Resolution No. 88-63), states that TDS exceeding 3,000 mg/l is not reasonably expected to supply a public water. Therefore, the concern of ingestion by drinking water extracted from the lower aquifer is not permitted or likely. The Resolution is included in CSS', *Final Remedial Investigation and Baseline Risk Assessment Report, dated July 2003*. No identified public or private drinking water wells are located within a 5-mile radial distance from the subject facility

The direction of the groundwater flow in both aquifers is generally west-northwest. The following groundwater flow velocities are estimated for the shallow and lower water bearing units:

The groundwater velocity of the shallow water bearing unit: $\mathbf{V_s}$ = 0.004 ft/day

The groundwater velocity of the lower water bearing unit: $\mathbf{V_l}$ = 0.163 ft/day

The site lies at an elevation of approximately 25 feet above mean sea level (MSL) [USGS, 1964]. The ground surface in the site vicinity is relatively flat with a gentle slope generally directed northwest towards the San Pablo Bay, the predominant hydrologic feature, located approximately 1-mile northwest of the site. San Pablo Bay flows in a southward direction towards the Pacific Ocean. There are no identified surface drinking water intakes or public drinking water supplies located within a 3-mile radius from the Site. A wetland/marsh area is located approximately ½-mile from the site on the west site of the Breuner property. The RI/BRA investigation concluded that of the identified COPCs, Benzene, 1,1-DCA, TCE, 1,1-DCE and vinyl chloride were found in the lower aquifer in offsite well W-38A at 4.5, 12, 59, 7.7, and 5.7 µg/l, respectively. Well MW-HLA3 (located in the shallow aquifer), had 1,1-DCA, TCE, 1,1-DCE, cis-1,2-DCE and vinyl chloride at concentrations of 4.1, 38, 4.1, 7.1 and 4.9 µg/l, respectively. Since the above listed wells are located within the Breuner property, immediately opposite the Southern Pacific Railroad adjacent to the subject site to the west, at low concentrations, their natural attenuation alone would suggest that there would not be opportunity for the COPCs to enter the Bay (located ~1/2 mile from wells MW-38A and MW-HLA3).

1.1.2 Surrounding Land Use

Currently, the site is occupied, partially paved, and enclosed with cyclone fencing with a locked gate. Site structures include a main building with an attached warehouse, a metal prefabricated storage building (small storage building), and 9 above-ground storage tanks within secondary containment. Primary land use to the north of the site is residential. Immediately west of the site is the Southern Pacific Railroad and beyond is the Breuner property, which is undeveloped but zoned "M-1 Industrial/Office Flex". The Parkway Transit Village has been proposed, but not finalized, for the eastern portion of the Breuner property (zoned "M-1 Industrial/Office Flex") directly opposite the site. The East Bay Regional Parks District has also considered the addition of the entire Breuner property to the Point Pinole Park. The western and northern portions of the Breuner property are zoned "CRR Community & Regional Recreational". The primary land uses

to the south and east of the site are commercial and light industrial. These areas and the subject site are located in a light industrial area zoned Richmond M-2. In the subsections that follow, historic (Section 1.1.3) and current site land uses (Section 1.1.4) are discussed.

1.1.3 History

RPI was founded by Mr. Homer Merrill in 1949 and facility operations began at the site in 1959 when the facility was moved from South Richmond. In 1958, U.S. Peroxygen Corporation (USP) and RPI initiated the purchase of a 6.5-acre parcel of bare land including the subject site. A small sub-parcel at the eastern end of this parcel was sold to Atlas Foundry who reportedly wanted additional land for potential expansion. The balance of the eastern portion of the parcel was purchased by USP and the western portion purchased by RPI, escrow closing in June of 1959. Five years later, USP purchased approximately one acre of the RPI property on the east and south resulting in the present RPI property extent shown on Figure 2.

Most RPI operations have been performed on the eastern portion of the present RPI property, although a small storage building and loading dock were constructed next to a rail spur on the western portion of the property (Figure 2). Transfer of raw materials and products to and from railcars occurred in this storage building. All mixing operations took place on the eastern portion of the site.

During operations, facilities at the site include a main building; the main building contains an office, mixing and resin operations, and a small storage building area used for storage. Additionally, there are 9 above-ground storage tanks with secondary containment located adjacent to the main building, although 6 of these are not currently being used for chemical storage. Further, a small storage building is located near the western boundary of the site, in which bulk chemicals are stored, as necessary.

1.1.4 Current Land Use

The subject site is zoned Richmond M-2, Light Industrial. Current land use of the site includes mixing and distributing water treatment chemical products. More recently, RPI mixes and distributes waterproofing resins and urethane plastics. The site is currently occupied, has limited pavement with natural vegetation, and is enclosed with cyclone fencing with a locked gate.

2.0 Site Characterization

Several investigations have been conducted at the site over the past several years. A summary of the previous and most recent investigation activities and results are discussed in the sections below.

2.1 Previous Investigations (1983-1998)

Previous investigations conducted at the Site, adjacent and vicinity sites have included soil and groundwater assessments, including numerous soil borings, and groundwater monitoring and/or extraction well (MW and/or EW) installations, in association with numerous COPCs, including chlorinated solvents and benzene in groundwater.

Groundwater investigation near the site began in 1983 with the installation of eight monitoring wells around and upgradient of two former surface impoundments on the adjacent Witco (now Chemtura) property. The surface impoundments were closed in 1986. The groundwater was analyzed for general chemistry parameters, pH, specific conductance, total organic carbon (TOC) and total organic halogens (TOX). Low (background) levels of metals were detected, pH ranged from 5.5 to 11.7 near an impoundment (6.0 to 6.8 in other areas), specific conductance ranged from 2,090 micromhos/cm to 30,000 umhos/cm (higher readings downgradient of surface impoundments), TOC ranged from 3 milligrams per liter (mg/l) to 3,200 mg/l (higher near the surface impoundments), and TOX ranged from non-detect (ND) to 6.8 mg/l (higher near the surface impoundments). Additional monitoring wells were installed in 1984 and 1985, some of which were installed on the Reaction Products property. In 1987, groundwater from well W-22, located near the northwestern corner of the Reaction Products property, contained trichloroethylene (TCE) at 3,400 micrograms per liter (ug/l), trans-1,2-dichloroethylene (trans-1,2-DCE) at 1,100 ug/l, dichloroethane (DCA) at 770 ug/l, dichloroethylene (DCE) at 280 ug/l, and trichloroethane (TCA) at 130 ug/l. A soil source removal action (excavation) was previously performed by others near W-22 to remove soil impacted from an underground petroleum pipeline release, believed to be the result of the pipeline being struck during drilling operations for the W-22's construction,

performed by a consultant to Witco (now Chemtura). The aromatic volatile organic compounds (VOCs), benzene and toluene are present in groundwater at W-22.

In 1989, RPI conducted a soil vapor survey to identify potential sources for TCE and other VOCs detected in W-22. This survey indicated that chlorinated hydrocarbons and fuel hydrocarbons were present in soil vapor in the western portion of the property. Subsequent investigations indicated that TCE was present at a concentration of 2,900 ppm in soil collected at a depth of 8.5 feet near borehole RP-15 on RPI's property.

In 1991, as part of an investigation at the Witco site, Ground Water Technology Inc. installed monitoring wells W-26, W-26A and W-27 along Morton Avenue. Sampling results indicated that chlorinated solvents were present in groundwater.

In 1993, RPI drilled eight boreholes and collected soil and groundwater samples. Two of these boreholes were converted into groundwater monitoring wells RP-1 and RP-2, which were then developed and sampled for chemical analysis. Only two soil samples contained greater than 1 ppm VOCs: one from 18.5 feet below ground surface in borehole RP-8 and one from 4.5 below ground surface in borehole RP-4. VOCs were detected in perched groundwater and deeper groundwater in the vicinity of the railroad spur. Historical groundwater data is presented in Table 3B.

A soil source removal action was performed by RPI on April 21, 1998. Excavation of approximately 250 cubic yards of VOC impacted soil was performed from the vicinity of the rail spur, located at the northwestern boundary of the site (Refer to Figure 2, vicinity of RP-15). The objective of the removal was to eliminate a potential source of groundwater contamination in this area by excavating all soil containing more than 300 parts per million (mg/kg) trichloroethene (TCE). Confirmation samples of the final excavation confirmed that the maximum concentrations of 2,900 mg/kg detected during previous investigations had been removed, and the Removal Action Workplan Goal of 300 mg/kg was achieved. Confirmation soil samples collected after the excavation revealed that the maximum VOC concentration detected was 0.67 mg/kg cis-1,2-DCE

collected from the southeastern sidewall. The maximum TCE concentration was 0.028 mg/kg detected from the base of the excavation.

2.2 Most Recent Remedial Investigation (2001-2003)

The Final Remedial Investigation/Baseline Risk Assessment (RI/BRA) was performed in accordance with a mutually agreed upon scope of work as outlined in the approved Work Plan, dated October 12, 2001. The work performed included the following primary activities:

- Clear (9) nine prospective boring locations of underground utilities: six located on the subject property, and three borings located North of the subject property and adjacent to Parchester Village, a residential community,
- Drill (9) nine temporary borings on the property under an appropriate permit using Geoprobe technology, collect groundwater, soil, and soil-vapor samples from each boring, and analyze samples for selected petroleum hydrocarbon compounds, halogenated volatile organic compounds (HVOCs), and general chemistry,
- Sample (4) existing monitoring wells for selected petroleum hydrocarbon compounds, halogenated volatile organic compounds (HVOCs), and general chemistry, and
- Six additional borings were performed by Hand-Auger to a depth of less than 5 feet. These borings were performed to assess the extent of hazardous materials and possible presence of shallow sources in a specific area near RP-1.

Results of general parameters and field measurements for groundwater samples are included as Table 1. Table 2A shows the results for hazardous material testing for soil samples. Historic hazardous material testing performed by a previous consultant, Weiss Associates, is shown on Table 2B. Table 3A is presented to show the results for groundwater sampling conducted at the subject facility. Table 3B is presented to show historical results hazardous material testing for groundwater samples conducted at the subject facility. Soil-vapor sampling results for the subject facility are as Table 4. As shown in Tables 2A and 4, no areas tested during the RI/BRA were shown to have any COPCs in soil or soil-vapor, respectively. Therefore, groundwater was identified as the primary concern for the subject site. As part of this RAW, Figures 3-6 are included to identify areas of impacted groundwater residing beneath the site. Background

information including boring logs and a cross-section of well placement on RPI property is included as Appendix B

The Remedial Investigation results indicate that VOCs in groundwater are the primary concern for this site and that soil sources are no longer present at the Site. No hazardous materials were detected in soil or soil-vapor at concentrations exceeding laboratory reporting limits.

The primary compounds of concern are TCE and 1,1-DCE discovered in the lower aquifer in boring RP-15A at 53,000 µg/l and 10,000 µg/l, respectively. In the shallow aquifer, at boring RP-15, cis-1,2-DCE and TCE were found at concentrations of 110 µg/l and 110 µg/l, respectively. 1,2-DCA was found in shallow groundwater monitoring well RP-1 at a concentration of 970 µg/l. Further, total petroleum hydrocarbons as gasoline (TPH-G) was discovered in the lower aquifer in boring RP-14A at a concentration of 600 µg/l. TPH-G and the associated component benzene has been found commingled with the above-listed chlorinated solvents, as well as 1,1-DCA, vinyl chloride, trans-1,2-DCE (daughter product of TCE) and 1,1,1-TCA in this area. There are no indications of dense non-aqueous phase liquids (DNAPLs) at the above listed concentrations. DNAPLs would be suspected if the discovered concentration was near the compound's solubility in water. For the above TCE concentration, the value is ~5% of its solubility in water. For 1,1-DCE, the discovered concentration is ~0.5% of its solubility in water.

The Remedial Investigation and Baseline Risk Assessment Report indicates that TCE impacted groundwater is located in the northwest portion of the site and may be associated with solvent loading operations conducted near a railroad spur and loading dock. A soils source removal was completed in this area by RPI in 1998. TCE has been detected in lower aquifer groundwater samples in this area as high as 53,000 µg/L. Data from monitoring wells indicates that the plume extends offsite to at least 200 feet west of the site. TCE, and its daughter product 1,1-DCE, are present in site groundwater and no soil is presently affected, due to the previous soil removal action. 1,1-DCE is found residing in shallow and lower groundwater bearing zones at concentrations as high as 200

micrograms per liter (ug/l) and 10,000 ug/l, respectively. As a secondary concern, 1,2-DCA has been found residing to the north of the site and has been detected as high as 970 ug/L in shallow groundwater. The 1,2-DCA plume extends approximately 150 feet to the west, but has not been found to migrate off site. 1,2-DCA was found at recent concentrations of 700 ug/L and 140 ug/l in shallow groundwater near wells RP-1 and W-26, respectively. Monitoring well W-23 did not contain any chlorinated compounds or other HVOCs using EPA Method 8260B. Further, no soil contamination was discovered for any of the above-listed contaminants in any area investigated during the most recent Remedial Investigation.

Secondary to the above, benzene has been identified as the primary aromatic VOC in groundwater near W-22 at the northwest corner of the Site. This contaminant is related to a historic petroleum pipeline leak near the location of W-22.

2.3 Human Health Risk and Ecological Assessment (2002-2003)

Human Health Risk

The carcinogenic risk was estimated for groups of potential future receptors at the site and for assumed potable water use. Carcinogenic risks were estimated for future onsite workers and future onsite visitors potentially exposed to COPCs residing in groundwater. The risk estimated using the Preliminary Endangerment method for any onsite persons is approximately 3.5×10^{-3}; a site-specific risk has been calculated at approximately 7×10^{-4}, using an upper 95% confidence level. Neither estimate of carcinogenic risk is within the USEPA [1990] target risk range of 10^{-6} to 10^{-4}.

Carcinogenic risks were estimated for onsite workers and visitors potentially exposed to underlying groundwater at the site. Please note that the risks estimated for these two groups of receptors may be overestimating their actual exposures due to the limited potential for contact with contaminated groundwater sources.

The risk estimates for receptors exposed to subsurface soils is negligible since impacted soils were previously removed and Remedial Investigation results determined that no soil is currently impacted by COPCs.

Overall, the calculated risk indicates that assumed exposure to TCE, 1,1-DCE, and 1,2-DCA contribute risk estimates that exceed the point of departure of 1×10^{-6} for future receptors. Exposures to these chlorinated solvents in groundwater also contribute to Hazard Indexes (HIs) exceeding the non-carcinogenic threshold of 1.0. Further, above-listed hazardous materials contribute to HIs exceeding the non-carcinogenic threshold of 1.0 for future hypothetical use of the shallow or lower water-bearing units for potable purposes.

Ecological Risk

Surface runoff is the main exposure pathway as it affects both terrestrial and aquatic biota. The railroad track routed between the subject site and Breuner property acts as a natural berm and channel; and therefore reduces the potential for surface runoff to affect the wetland/marsh area of the San Pablo Bay margins. This ecologically sensitive area is located about ½-mile west of the subject site in the western Breuner property (Figure 2).

Information for the biological characterization of the ecological risk was obtained from the draft EIR, *Edgewater Technology Park/ Breuner Marsh Mitigation Bank*, dated June 2002. The EIR addressed habitat and special species found within the Breuner property.

The table on the following page includes all wildlife habitat or special species suspected to reside in the Breuner property.

Wildlife Habitat and Special Species Table (Reproduced from RPI's 2003 Final Remedial Investigation and Baseline Risk Assessment Report)

Item No.	Species	Listing	Search Location/ Potential Habitat	Results/ Conclusion
1	Short – eared owl	CA species of special concern	Denser stands of herbaceous vegetation located in various areas on property	Potential nesting habitat area/ Did not nest onsite during study
2	Burrowing owl	CA species of special concern	Nine California ground squirrel complexes suitable for owls	Potential nesting habitat area/ Did not nest onsite during study
3	Northern harrier	CA species of special concern	Denser stands of herbaceous vegetation located in various areas on property	Potential nesting habitat area/ Did not nest onsite during study
4	White-tailed kite	CA fully protected species	Tree and large shrubs located at or near the northern and eastern boundary	Potential nesting habitat area/ No PEA Concern
5	Salt marsh harvest mouse	Federal and State Endangered species	Northern half and western boundary of property/ Non-tidal & tidal wetlands with plant coverage	Sighting (CNDDB 1999) in Giant Marsh/ Potential nesting habitat area
6	California black rail	State threatened species	Tidal salt marshes/ Northern and Western Property boundaries	Sighting (CNDDB 1999) in Giant Marsh/ Nesting habitat uncertain
7	California clapper rail	As Item #5	As Item #5	As Item #5/ habitat uncertain
8	Pallid bat	NA	Unoccupied buildings-southern portion of site/ Limited suitable roosting habitat	No bats observed/ No concern to PEA
9	Western big-eared bat	NA	Bldg.-south portion of site/ Limited suitability	No bats observed/ No concern

The ecological risk assessment concluded that it is unlikely that the above-mentioned species will be affected as a result of COPCs discovered in the vicinity of the subject site. Further, we have found no documented or observed information to conclude that there are any impacts to wildlife habitats and/or special species located in the Breuner property.

3.0 Remedial Action Goals and Objectives

Remedial Action Objectives (RAOs) are established to protect human health and the environment. RAOs are based on site-specific media of concern, site-specific COPCs, exposure routes and receptors, and acceptable contaminant level or range of contaminant levels for each exposure route. The media of concern for the site is groundwater, further, this RAW addresses shallow and lower aquifers identified near the western boundary and underlying the site. The overall objectives of the removal actions described in this RAW include:

- Minimize exposure of humans to TCE, and 1,1-DCE found in shallow and lower aquifers.
- Remove the impacted groundwater that exceeds the human health risk criteria (based on a cancer risk criteria of less than 1×10^{-6}, and a hazard index of less than 1.0).
- Minimize the potential for migration of the above-listed chlorinated solvent compounds from groundwater.

The DTSC Order states that Drinking Water Standards shall be the Remedial Action Objectives (RAOs) for the site. Applicable or Relevant and Appropriate Requirements (ARARs) for the site are California Maximum Contaminant Levels (MCLs) in drinking water and are included in the table below for the various COPCs.

Compound	Concern	MCL (ppb)
Trichloroethene (TCE)	Primary	5
1,1-Dichloroethene (1,1-DCE)	Primary	6
1,2-Dichloroethane (1,2-DCA)	Primary	0.5
Benzene	Secondary	1
Chloroform	Secondary	100
1,1-Dichloroethane (1,1-DCA)	Secondary	5
cis-1,2-Dichlroethene (cis-1,2-DCA)	Secondary	6
Toluene	Secondary	150
1,1,1-Trichloroethane (1,1,1-TCA)	Secondary	200
Vinyl Chloride (VC)	Secondary	0.5

Above information is taken from the Summary of Tier 1 Lookup Tables, California EPA RWQCB. MCLs listed are the California Department of Health Services Primary MCLs.

4.0 Identification and Evaluation of Alternatives

The purpose of this Section of the RAW is to identify and screen possible removal action alternatives that may best achieve the RAOs discussed in Section 3.0. The removal action will be conducted in accordance with protocols of Chapter 6.8, Division 20 of the California Health and Safety Code. The screening of removal action alternatives was conducted in general accordance with the EPA document, *Guidance on Conducting Non-Time Critical Removal Actions under CERCLA*. As such, removal action alternatives were screened and evaluated on the basis of their effectiveness, implementability, and cost.

4.1 Identification and Analysis of Removal Action Alternatives

Each of the removal action alternatives is screened based on effectiveness, implementability, and cost, as defined below:

Effectiveness - This criterion focuses on the degree to which a removal action reduces toxicity, mobility, and volume, minimizes residual risk and affords long-term protection, minimizes short-term impacts, how quickly it achieves protection, and overall protection of human health.

Implementability - Removal actions are evaluated with respect to technical feasibility and applicability to site conditions. Some examples of this criterion include the ability to obtain necessary permits, regulatory approval of remedial actions, availability of necessary equipment and skilled workers, and acceptance by the State and the community.

Cost - This criterion relates to relative cost screening based on approximate capital and operational and maintenance costs.

Screening of several technology types using the above criteria was conducted to select removal actions for further evaluation. Based on this screening, the three removal actions identified and developed are:

Alternative 1 – No Action

Alternative 2 –Hydrogen Releasing Compounds with Bio-Inoculum (HRC/BIO)

Alternative 3 – Ground Water Pump and Treat

Each alternative is discussed in the following Sections.

4.1.1 Alternative 1 – No Action

As required by the DTSC, the No Action alternative has been included to provide a baseline for comparisons among other remedial alternatives. This action includes no institutional controls, no treatment of groundwater, and no monitoring. The No Action alternative would not require implementing any measures at the site and no costs would be incurred. Consequently, there would be no activities that would disturb site groundwater, and therefore, no short-term risks to site workers or the community as a result of implementing this alternative.

However, under the No Action alternative, the impacts due to the presence of elevated chlorinated solvents in groundwater would not be addressed and there would be no reduction in the potential risks. This alternative does not result in reducing the toxicity, mobility, or volume of impacted groundwater present. In addition, this alternative does not provide overall protection of human health and the environment.

4.1.2 Alternative 2 –Hydrogen Releasing Compounds and Bio-Inoculum (HRC/BIO)

This alternative would consist of injecting HRC compounds into impacted areas by means of drilling borings in a grid pattern at pre-determined spacing to be used as injection points. Further, three (3) monitoring wells would be installed to assess the performance of the removal action. Injection areas of HRC compound and proposed monitoring well locations are presented as **Figures 7 and 8**. The HRC would reduce contaminants in concern areas of the site using destructive mechanisms, such as reductive dechlorination. The process is as follows. HRC slowly releases lactate upon hydration. Naturally occurring microorganisms create hydrogen and reducing conditions in the aquifer when they metabolize lactate and facilitate a process known as reductive dechlorination. Reductive dechlorination is one of the primary attenuation mechanisms by which chlorinated solvent laden groundwater can be stabilized and/or remediated. HRC is used to accelerate the in-situ biodegradation rates of CHs via anaerobic reductive

dechlorination processes. Microbes capable of this reduction utilize hydrogen to progressively remove chlorine atoms from chlorinated hydrocarbon contaminants. In general, reductive dechlorination of ethenes occurs as a sequential breakdown from perchloroethene (PCE) to trichloroethene (TCE) to dichloroethene (DCE) to vinyl chloride (VC) and finally to ethene. To expedite the breakdown of chlorinated solvents with HRC, microbiology specific to chlorinated solvent breakdown will be used to supplement this alternative. A brief explanation of this coupled alternative is included below. In the area near RP-15, approximately 2,640 pounds of HRC compound will be injected to the lower aquifer and approximately 38 liters of Bio-inoculum will be injected into 25 injection points (at the standard rate of 1.5 liters per injection point). Near RP-14 and W-22, approximately 960 pounds of HRC will be injected in the shallow aquifer, between 20 and 30 feet bgs., and 24 liters of Bio-inoculum will be injected into 16 injection points. Further, a reapplication of half the original dose of HRC without Bio-inoculum will be performed at an appropriate time depending on the evaluation of the trends of COPCs. A two-year period of analysis has been chosen for this alternative. This period will allow sufficient time to analyze the effectiveness of the HRC/BIO strategy. During this period, a baseline monitoring event and quarterly monitoring will occur and will include sampling to monitor for COPCs, as well as sampling to monitor bio-attenuation parameters.

The HRC/BIO alternative would consist of injecting HRC through temporary borings coupled with the injection of microbes specific to degrading chlorinated solvents. Because HRC is a food product producing lactate when hydrolyzed by water, by-products of this treatment are harmless. Further, bio-inoculum utilizes lactate for their growth so chlorinated solvents may be destroyed at a greater rate. The final end product of TCE degradation, ethene, would be achieved at a faster rate than with HRC alone. Remediation product information for HRC is included as Appendix C.

Effectiveness

The HRC with Bio-Inoculum (HRC/BIO) alternative would involve limited disturbance of the impacted groundwater. Further, the placement of HRC/BIO would require little exposure to the COPCs and the short-term risks would be low. The installation of HRC/BIO would require long-term monitoring and possible reapplication to provide long-term effectiveness. Performance monitoring would be required to determine if

reapplication of HRC/BIO to the removal zone is necessary depending on analysis of the most recent analytical data. Further, monitoring well installation would be required to analyze and support ongoing destruction of COPC.

Application of HRC/BIO would lessen toxicity or volume of the COPC and lessen the mobility and migration of contaminants. The overall protection of human health and the environment can be achieved through HRC treatment with Bio-inoculum, provided that long-term monitoring and possible reapplication is performed to assess and assist these enhanced natural degradation processes.

Implementability

HRC/BIO treatment is a relatively simple technology that is easily implemented and can be quickly installed. It should be noted that HRC application is a relatively new technology and results vary from site to site depending on site geology and other factors. Further, permanence of allowing the COPCs to remain on site should be reduced if proper application is achieved. Addition of a Bio-inoculum is used in conjunction with HRC to supplement populations of indigenous microbes that will metabolize the lactate provided by HRC and could expedite the destruction of chlorinated solvents by reductive dechlorination. Also, obtaining permits and regulatory approval for borings and well placement would be required.

Cost

HRC/BIO technologies typically involve low to moderate costs. Even with monitoring and potential reapplication, HRC/BIO can be considerably more economical than groundwater pump and treat (GPT) or other technologies at chlorinated hydrocarbon impacted sites. Industry costs are approximately $86,000 for installation and 2 years of groundwater monitoring. This cost includes initial HRC/BIO application with one reapplication if necessary (two injections-total), and 2 years of groundwater monitoring. A 2-year time period was chosen because evaluation of COPC destruction by enhanced natural attenuation is expected to occur during this period. Further, laboratory data for COPCs and bio-attenuation parameter results obtained during this period are expected to yield enough information to adequately assess the effectiveness of HRC/BIO. During the ongoing analysis of this strategy, cleanup goal objectives will be looked at and modifications to the remediation strategy may occur if needed. Please note that the 2-year period of implementation of this alternative has been proposed to gather enough information to analyze the effectiveness of the cleanup strategy. If results are not

achieved pertaining to Cleanup Goals, addition injections would be required. Please note that an assessment will be made after the first year, but the effectiveness of this alternative may not yield enough data within this period to justify when cleanup goals will be achieved.

4.1.3 Alternative 3 – Groundwater Pump and Treat

The Groundwater Pump and Treat (GPT) alternative would consist of design and construction of a pump and treat system. This installation would require three (3) pumping wells and two (2) monitoring wells. Further, pumping tests would be required to determine the appropriate treatment system requirements. Monitoring would also be required to assess the performance of the system. Please note that installation of this system would alter the groundwater gradient of the aquifers and may draw contaminants in groundwater from off-site sources onto the site or into areas with no prior impacts. Multiple sites with groundwater impacts adjoin or are in the near vicinity of the RPI property.

A summary of the assessment of this alternative for each of the screening criteria is provided in this Section.

Effectiveness

The Groundwater Pump and Treat alternative would involve disturbance of the impacted groundwater. However, the implementation of this system would require little exposure to the COPC and the short-term risks would be low.

The installation of GPT would require monitoring to assess the performance of the system to remove onsite contaminants. Also, operation and maintenance activities would be required as part of this alternative. Further, along with the pumping wells, monitoring well installation would be required to monitor ongoing removal of COPCs. Based on these factors, the effort required to ensure long-term effectiveness is considered high.

Application of GPT would lessen toxicity or volume of the COPC and limit mobility and migration of contaminants. It should be noted that installing a GPT system could alter the groundwater gradient of the aquifers and may draw contaminants in groundwater from off-site sources onto the site or into areas with no prior impacts. This alternative reduces the potential risks from the exposure to the COPCs at the site and accomplishes

the RAOs Consequently, it is considered to be protective of human health and the environment.

Implementability

Groundwater Pump and Treat is a relatively simple technology that would require time to implement and install. Further, permanence of COPC to remain on-site would be reduced by removal of contaminants from the groundwater aquifer(s). Please note that implementation of an onsite GPT system would address onsite COPCs but would not address adjacent properties with COPC concerns. Also, obtaining permits and regulatory approval for pumping and monitoring well installation and treatment system construction would be required. In addition, community acceptance for this alternative may not be likely since the operation of the system may draw impacted groundwater from offsite sources into areas with no prior impacts. COPCs may initially decrease with time at a greater rate than other above-listed alternatives, due to its active removal approach. However, experience has shown that concentrations of COPCs in groundwater may approach a nearly irreducible limit asymptotically and therefore GPT may not have the long term effectiveness of biotechnologies such as HRC/BIO that act on the COPCs in-situ.

It is anticipated that regulatory approval would be granted since GPT would decrease COPCs within an acceptable time-frame, although cost of implementation and operation and maintenance would be greater than the other alternatives.

Cost

The estimated cost for GPT design and construction, including pump testing, connections for sewer and electrical, disposal of soil boring cuttings and/or groundwater through the sanitary sewer is approximately $65,000. The anticipated duration of GPT to meet ARARs is 30 years with an annual cost of about $32,000 in 2004 dollars for a total 30 year construction and operation cost of $1,016,000 in 2004 dollars. This estimate includes permitting, cost of installation, monitoring, maintenance, and disposal of treated groundwater through the sanitary sewer.

4.2 Comparative Analysis of Removal Action Alternatives

A comparative analysis was conducted to identify the advantages and disadvantages of each remedial alternative. The comparative analysis of the remedial alternatives was conducted to address the three criteria listed in Section 4.1

4.2.1 Effectiveness

The No Action and HRC/BIO alternatives do not involve activities that would disturb the impacted groundwater, other than purging wells for monitoring requirements and injecting HRC/BIO substance into designated areas. Therefore, there would be negligible short-term risks to on-site workers or the community as a result of implementing these alternatives. GPT has a greater disturbance to impacted groundwater and would present a slightly greater short-term risk to onsite workers or the community, however, risk associated with these alternatives can be sufficiently mitigated through monitoring and site control measures, as discussed in Section 5.5. With regards to short-term effectiveness, the HRC/BIO or GPT alternatives are favorable. The No Action alternative has negligible effectiveness.

Under the No Action alternative, the impacts associated with the site-specific COPCs would not be addressed. Some natural attenuation of the COPCs may reduce their concentrations with time but not significantly. Consequently, there would be little reduction in the potential risks and the RAOs would not be achieved. The HRC/BIO or GPT alternatives would reduce or eliminate, respectively, potential exposure to COPCs, and therefore, accomplish the RAOs. Once implemented, these alternatives would require long-term monitoring to ensure their effectiveness.

Of the listed remedial strategies, the No Action alternative does not result in significantly reducing the toxicity, mobility, or volume of COPCs present at the site. Removal of COPCs by GPT or their destruction by HRC/BIO will reduce the toxicity, mobility and volume of COPCs present at the site.

The No Action alternative would not result in any significant reduction in the potential risk associated with COPCs at the site, and therefore, the RAOs would not be achieved HRC/BIO or GPT are considered to be protective of human health and the environment.

4.2.2 Implementability

No measures would be implemented for the No Action alternative. HRC/BIO or GPT can be implemented.

4.2.3 Cost

A summary of estimated costs to implement the proposed alternatives is presented in the table below. Costs for Alternative 2 are based on implementing the selected remedial alternative and two (2) years of removal operations. Costs for Alternative 3 are based on implementing the selected remedial alternative and thirty (30) years of removal operations.

SUMMARY OF ESTIMATED COSTS			
	Removal Action Alternative		
Costs	Alternative 1 No Action	Alternative 2 HRC/BIO	Alternative 3 GPT
Direct Capital Costs			
Equipment Costs			*$9,800*
Material Costs		*$29,500*	*$7,150*
Monitoring Well Installation		*$6,000*	*$6,000*
Pumping Well Installation			*$9,000*
Indirect Capital Costs			
Engineering and Design Expenses		*$10,000*	*$26,500*
License and Permit costs		*$1,400*	*$7,000*
Annual Removal Action Site Control Costs			
Reapplication of HRC + Install		*$14,760*	
Equipment Costs (for above)			
Operational Costs			*$9,000*
Maintenance Costs			*$13,000*
Laboratory/Sampling Costs		*$16,300*	*$1,900*
Auxiliary materials (Bio-Inoculum)		*$11,200*	
Operation and/or monitoring		*$11,000*	*$717,000*
Total	***$0***	***$100,160****	***782,450***

* Estimate includes reapplication of HRC at 50% of original dose and no reapplication of Bio-Inoculum
Work to be performed to address TCE impacted areas near wells/borings W-22, RP14A, and RP15A.
2nd year includes monitoring only

** Estimate includes two (2) monitoring wells and three (3) pumping wells to address TCE impacted areas near wells/borings W-22, RP14A, and RP15A.
Estimate includes operation and maintenance of GPT system and monitoring for 30 years.

4.3 Recommended Removal Action Alternative

Based on the comparative analysis described in Section 4.2, **Alternative 2: HRC with Bio-inoculum** is the preferred and recommended removal action alternative for addressing the site. This alternative was selected because it was determined to be effective, implementable, and cost effective as discussed.

The overall short-term effectiveness and implementability of this alternative is moderate to high. Potential risks include exposure of on-site workers to COPCs during sampling activities. However, these risks are readily mitigated by the proper use of personal protective equipment and adherence to procedures outlined in the Health and Safety Plan (HSP-Appendix A).

The selected technology has a moderate long-term effectiveness and reliability. Groundwater residing in both identified water bearing zones impacted with COPCs will undergo reductive dechlorination destruction mechanisms which will reduce the concentrations of COPCs by means of this enhanced natural attenuation strategy. Further, laboratory sampling conducted on a quarterly basis will provide needed information to determine the amount of in-situ COPCs remaining at that time, as well as, bio-parameter indication to confirm the destruction process that HRC/BIO provides for site concerns.

The selected removal action will result in the reduction of toxicity, mobility, and volume of COPCs at the site through application of HRC/BIO to the impacted groundwater. The mobility of COPCs will be reduced by destructive mechanisms and eventually reach the final end product of ethene, which has no known carcinogenic potential.

Further, overall protection of human health and the environment is high considering that the identified groundwater aquifers may not be used for any type of water supply, and natural destructive mechanisms enhanced by HRC/BIO will reduce COPCs.

5.0 Removal Action Implementation

Implementation of the removal action consists of a series of separate tasks. The following sections discuss each task and the activities of which they consist: Selecting remediation locations (Section 5.1); remediation methodology including groundwater monitoring (Section 5.2); permits and notifications (Section 5.3); utility clearance (Section 5.4); and field variances (Section 5.5). An *Implementation Report* will be submitted to DTSC within 30 days after the installations of the monitoring wells, initial sampling of the monitoring wells, and initial injection of HRC and Bio-inoculum. The report will include a summary of the implementation activities and notation of any variance from the approved plan. A Completion Report, which summarizes the removal action activities including groundwater monitoring, will be submitted to DTSC after the groundwater monitoring has shown attainment of cleanup goals.

5.1 Selecting Remediation Locations

The selected removal action remedy combines injection of HRC compound and Bio-inoculum into the shallow and lower aquifers' impacted groundwater. In order to achieve RAOs, impacted groundwater residing in the shallow water bearing zone will be treated in-situ at a target depth of 15-30 feet below ground surface (bgs) and impacted groundwater residing in the lower zone will be treated at a target depth of 25-45 feet bgs, for concentrations of trichloroethene and its affiliated daughter product, cis-1,2-DCE.

The HRC/BIO Remediation layout is shown in **Figure 7**. The HRC/BIO Remediation layout for wells W-22, RP-14A and RP-15A is presented as **Figure 8**.

5.2 Remediation Methodology

The proposed removal action will include injection of hydrogen releasing compound (HRC) and Bio-inoculum into the lower identified aquifer, at 8 foot spacing intervals and a total of 25 injection points near the proposed well RP-15A. Next, 6 injection points will be placed in a linear arrangement near proposed well RP-14A at a 10 foot spacing interval. Injection points near RP-14A and 15A will address lower aquifer COPCs and will be advanced until the lower zone is reached and visually confirmed through use of a test boring within each designated area. 10 injection points will be arranged near the current monitoring well W-22 at 10 foot spacing to address the impacted water-bearing zone that resides 20-30 feet bgs (shallow water bearing zone). Interval spacing is a function of the concentration of the COPC; further, closer interval spacing is required for

higher concentrations as determined by Regenesis (HRC product manufacturer). Due to the higher concentrations previously observed near boring RP-15A, the typical 10 foot spacing for application is reduced to 8 feet in this area.

Bio-inoculum will be injected into temporary borings through a small diameter PVC pipe to the target depth and retracted to a selected interval by using a direct push drilling rig. Next, once the BIO has been injected at a specific interval, the product dispensing pipe will be lowered again to the target depth and the appropriate quantity of HRC will be pumped into the impacted groundwater area. After injections of HRC/BIO are completed the borings will be grouted as directed in the boring permit.

Installation of three monitoring wells will be required near the northwestern portion of the site in or near the same location of previous borings RP-15 and RP-14 and be converted to the proposed wells RP-15A and RP-14A, respectively. Proposed well RP-16A will be installed to assess the upgradient conditions of the RP-15A and RP-14A remediation areas. These monitoring wells are planned to be located in the lower aquifer identified by the letter "A" following the well designation (e.g., RP-15A). Current monitoring well W-38A (located in the Breuner property) will be sampled for VOCs to assess downgradient conditions of the RP-15A and RP-14A remediation areas. Monitoring Well W-37 will be used to determine upgradient concentrations and monitoring well MW-HLA3 will be used to assess downgradient conditions and VOC degradation of the W-22 remediation area. The Remediation Monitoring Locations for well W-22 and proposed lower zone wells RP-14A and RP-15A are shown in **Figure 8**. Waste soils resulting from monitoring well drilling operations will be temporarily stockpiled on plastic or in 55-gallon DOT drums and sampled for waste profile and disposal purposes

To address COPCs, namely 1,2-DCA, near monitoring well RP-1 (located in the shallow aquifer at the northern boundary of the site), a groundwater monitoring strategy is proposed. Monitoring will be performed on a quarterly basis for well RP-1 and will include analysis for VOCs by EPA Method 8260B. Monitoring of this area will continue until RAOs are achieved or regulatory authority reduces the sampling frequency. Monitoring well W-27 will be sampled to assess upgradient conditions and monitoring well W-26 will be sampled to assess concentrations downgradient of RP-1. The Remediation Monitoring Locations for RP-1 are shown in **Figure 9**.

The removal action activities will take place on weekdays and during the approximate hours of 7:00 am to 6:00 pm. All work will be conducted during daylight hours.

The site will be secured utilizing the existing fencing to reduce the potential for unauthorized personnel to enter the site area. Although volatile organic concentrations (VOCs) are not expected to be encountered, air monitoring of the workers' breathing zones will be conducted using a direct-reading organic vapor analyzer (OVA) or photoionization detector (PID) during well/boring installation as well as groundwater purging activities, consistent with standard health and safety procedures for monitoring worker exposures. If VOCs are detected above ambient concentrations in the breathing zone, vapor engineering control efforts will be increased.

5.2 Contingency to Extend Selected Remediation Methodology

This RAW considers the application of the selected remediation methodology (HRC and Bio-inoculum to the vicinity of locations W-22, RP-14A and RP-15A, and monitoring of the COPCs near RP-1 and the off-site, down gradient W-38A and MW-HLA3 areas. Additional application of HRC and Bio-inoculum treatment of these latter areas would be implemented, as a contingency, in the event that concentrations of the COPCs and their daughter products has not decreased or shown a decreasing trend after two years of monitoring.

5.3 Permits and Notifications

In addition to the approval of the RAW, the scope of activities necessary to complete the removal activities will involve monitoring well and temporary boring construction permitting from the local governing agencies. The following list presents the applicable agencies and permits and/or notification that will need to be notified or obtained, respectively, prior to the initiation of any field activities.

Contra Costa County
Contra Costa County Environmental Health Department

- Boring and Monitoring Well Installation Permits

State of California
California Environmental Protection Agency, DTSC

Other
Underground Service Alert (USA) of Northern California - California AB73.

- Notification to require subsurface utility location

5.4 Utility Clearance

A geophysical survey will be conducted prior to implementation of the RAW to identify subsurface power lines and obstructions at the site. Geophysical methods that may be used include magnetic-, electromagnetic-, and ground penetrating radar line location. Underground Service Alert (USA) will be contacted at least 48 hours before the well or boring efforts are initiated.

5.5 Field Variances

DTSC will be informed of significant variances from the RAW prior to any action being taken except for emergencies (when an immediate response is required). The field variances will be documented in the *Removal Action Completion Report* prepared for the project.

6.0 Sampling and Analysis Plan

The proposed removal action will require the collection and analysis of groundwater samples to establish a baseline for present TCE and daughter products concentrations and general parameters that will be used to monitor bio-attenuation parameters. Further, sampling shall continue throughout the remediation process and be performed on a quarterly basis until RAOs have been reached, or DTSC accepts a reduced sampling strategy. All sampling will be conducted in general accordance with the applicable field procedures, Quality Assurance/Quality Control (QA/QC) protocols, and Quality Assurance Project Plan (QAPP) presented in the DTSC-approved Remedial Investigation and Baseline Risk Assessment Report prepared for the site. Field quality assurance procedures require that a duplicate sample be taken at a frequency of 1 for every 10 samples taken. QA/QC procedures and documentation for sampling are included with lab results from a California certified laboratory and performed by using a Method Blank and a laboratory control spike, where appropriate, for each analyte. The QAPP dictates that reporting limits for each analyte must be at or below California MCLs. Currently, the laboratory's reporting limit for the Site COPCs is at 0.5 parts per billion (ppb) for water samples. In the following section (Section 6.1), groundwater sampling of the remediation area is discussed.

6.1 Groundwater Monitoring of Remediation Area

Impacted groundwater will be purged from monitoring wells to the target depth of 15-30 feet bgs and 25-45 feet bgs, for the shallow and lower water bearing zones, respectively. An appropriate number of samples will be collected from monitoring wells W-22, RP-14A (proposed well), and RP-15A (proposed well). Proposed wells RP-14A and RP-15A will be located in the same locations as prior borings RP-14 and RP-15 (as shown on Figure 2). One sample from each above-listed well will be collected on a quarterly basis. Therefore, three total samples will be collected from the HRC/BIO treatment area each quarter. Further, 1 sample per quarter will be collected from monitoring well RP-1, located at the northern boundary of the site, to monitor COPCs in this area. Samples will be collected from the identified groundwater aquifer and will be directed to the project lab for expedited analysis of halogenated volatile organic compounds (HVOCs, EPA Method 8260B). Depending on the results of the HVOC testing with respect to the effects of HRC/BIO treatment, associated bio-parameter testing may be conducted at the discretion of CSS. Evaluation of bio-parameters may include analysis of total organic carbon (TOC) (EPA Method 415.1 or 9060), metabolic acids (HPLC/UV), nitrate (EPA

Method 353.1 or 9056), sulfate (EPA Method 375.3 or 9056) and/or carbon dioxide, methane, ethane, and ethene tests (ASTM D1945).

Groundwater sampling in all identified remediation areas, the northern site boundary and in upgradient wells and down-gradient wells will be sampled quarterly until RAOs are achieved, or DTSC accepts a reduced sampling strategy, or DTSC determines that sampling is no longer required.

It should be noted that the amount of material injected into remediation areas is a relatively small volume as compared to the aquifer volumes and potential plume displacement due to the injected materials is not considered a technical issue. Referring to the calculation sheets from Regenesis included in Appendix C Remediation Information, the volume of groundwater present in the effective pore spaces of the treatment areas is estimated as 94,260 gallons. A total of 3,600 pounds of HRC will be injected into these areas during an application. At a density of about 7.1 lbs per gallon this translates into an injected HRC volume of 507 gallons, or 68 ft^3, of HRC. In addition a negligible volume of 62 liters of bio-inoculum, or 16 gallons, will be injected for a total application volume of about 523 gallons, or about one-half of one percent of the total pore volume. Assuming an average thickness of the zones to be treated of 16 feet and a width of treatment area of 80 feet (conservative estimate) then the effective potential plume displacement due to an injection event is = 68 ft^3 / {16 feet x 80 feet x 0.25 (estimated effective porosity)}, or 0.21 feet of plume displacement. In addition, during HRC/BIO application, injections will be performed working from west to east, thereby forcing displacement, if any, in the upgradient direction, towards the interior of the RPI property. Therefore, plume displacement will not be an issue and wells selected to analyze this remedial alternative will be adequate to assess COPC concerns.

6.2 Record Keeping

The removal action contractor will be responsible for maintaining a field logbook, which will serve to document observations, personnel on site, equipment arrival and departure times, and other important project information. Logbook entries will be complete and accurate enough to permit reconstruction of field activities. Logbooks will be bound, with consecutively numbered pages and each page will indicate the date and time of the entry. All entries will be legible, written in black or blue ink, and signed by the author. Language will be factual and objective. If an error is made, corrections will be made by

crossing a line through the error and entering the correct information. Corrections will be dated and initialed.

Record keeping will be implemented upon field work deployment and be ongoing throughout remedial activities conducted at the site. Further, a Daily Field Report will be used to document sampling activities as they occur.

Following is a proposed implementation schedule for the HRC/BIO remediation alternative

No. of days	**Task**
30	Permitting for boring/monitoring well installation will occur within 30 days from acceptance of this RAW.
30	After first 30 days, scheduling of sub-contractor to install borings and monitoring wells will be performed. HRC/BIO products to be injected into borings will also be obtained during this period.
30	Injection of HRC/BIO into injection points (borings), monitoring well installations, and baseline sampling will occur within 90 days of RAW approval.
30	An Implementation Report shall be completed and submitted to DTSC 30 days after completion of injections to borings and monitoring well installations.

Please note that results from baseline sampling will be incorporated within our first Quarterly Report for the site per the approved RAW.

7.0 Health and Safety Plan

A site-specific HSP has been prepared for the site and has been included as Appendix A. The HSP has been prepared in accordance with current safety standards in accordance with guidelines set forth in Title 8 of the California Code of Regulations, Section 5192.

8.0 Administrative Record

Document Date	Document Type	Title/Subject	Author/Affiliation	Recipient/ Affiliation	Document Location
	Regulations	California Code of Regulations, Title 22, Divisions 4 and 4.5, Volume 29A	-----	-----	Readily Available
	Regulations	California Health and Safety Code, Division 20, Chapters 6.5, 6.6, and 6.8	-----	-----	Readily Available
Aug-93	Guidance	Guidance for conducting remedial investigations and feasibility studies under CERCLA	U.S. EPA	-----	Readily Available
Dec-96	Report	Groundwater Protection Study	Weiss Associates	DTSC	DTSC file room under Reaction Products
1997	Guidance	Practical Guide to Environmental Community Relations	Carol J. Forest et al	-----	Readily Available
Sept-98	Guidance	Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water, Appendices B & C.	U.S. EPA	DTSC	Readily Available
Sept-98	Letter	Removal Action Work Plans	Barbara Coler	DTSC	DTSC file room under Reaction Products
Sept-98	Report	Summary Report for Reaction Products	Weiss Associates	DTSC	DTSC file room under Reaction Products
Dec-98	Report	Final Removal Action Report	Weiss Associates	DTSC	DTSC file room under Reaction Products
Feb-99	Report	1998 Annual Report of Groundwater Monitoring and Sampling- Witco Corp.	IT Corporation	DTSC	DTSC file room under Witco
June-99	Guidance	Preliminary Endangerment Assessment Guidance Manual	DTSC	-----	Readily Available
Aug-99	Report	Second Quarter 1999 Groundwater Monitoring and Sampling- Witco Corp.	IT Corporation	DTSC	DTSC file room under Witco
Nov-99	Report	Third Quarter 1999 Groundwater Monitoring and Sampling- Witco Corp.	IT Corporation	DTSC	DTSC file room under Witco

Document Date	Document Type	Title/Subject	Author/Affiliation	Recipient/ Affiliation	Document Location
Mar-00	Legal	Imminent or Substantial Endangerment Determination Order and Remedial Action Order	DTSC	Reaction Products	DTSC file room under Reaction Products
June-00	Report	1999 Annual Report of Groundwater Monitoring and Sampling for Crompton	Enviro-Sciences, Inc.	Crompton	DTSC file room under Crompton Corporation
Mar-01	Report	2000 Annual Report of Groundwater Monitoring and Sampling for Crompton	Enviro-Sciences, Inc.	Crompton	DTSC file room under Crompton Corporation
Mar-01	Legal	Notice of Proposed Determination of Non-Compliance with Imminent or Substantial Determination Order	Barbara Cook	Reaction Products	DTSC file room under Reaction Products
Jun-01	Letter	Review of Work Plan for Field Investigation and Risk Assessment, dated April 23, 2001-Request for additional Groundwater Samples	Barbara Cook	Reaction Products	DTSC file room under Reaction Products
Sept-01	Letter	Work Plan for Field Investigation and Risk Assessment, Revisions to Work Plan per meeting between Reaction Products and DTSC	Barbara Cook	Reaction Products	DTSC file room under Reaction Products
Nov-01	Letter	Work Plan for Field Investigation and Risk Assessment, Revised Work Plan is acceptable	Barbara Cook	Reaction Products	DTSC file room under Reaction Products
Dec-01	Letter	Revised Health and Safety Plan-determination that HASP is adequate and CSS may proceed with Remedial Workplan, dated October 12, 2001	Barbara Cook	Reaction Products	DTSC file room under Reaction Products
Mar-02	Report	Fourth Quarter and Annual 2001 Report of Groundwater Monitoring and Sampling for Crompton Corporation	Enviro-Sciences, Inc.	Crompton	DTSC file room under Crompton Corporation
June-02	Report	Edgewater Technology Park/ Breuner Marsh Mitigation Bank Draft EIR-Ecological Summary Portion of Report	Impact Sciences, Inc.	City of Richmond	Readily Available

Document Date	Document Type	Title/Subject	Author/Affiliation	Recipient/ Affiliation	Document Location
Apr-03	Report	Fourth Quarter and Annual 2002 Report of Groundwater Monitoring and Sampling for Crompton Corporation	Shaw E & I	Crompton	DTSC file room under Crompton Corporation
May-03	Report	Remedial Investigation and Baseline Risk Assessment Report for Reaction Products	CSS	DTSC	DTSC file room under Reaction Products
Jun-03	Guidance	Governor's Office of Planning and Research, California Environmental Quality Act, Statutes and Guidelines	State of California	-----	Readily Available
Jun-03	Letter	Request edits to Risk Assessment/ Baseline Risk Assessment	Barbara Cook	Reaction Products	DTSC file room under Reaction Products
Jul-03	Report	Final Remedial Investigation/Baseline Risk Assessment	CSS	DTSC	DTSC file room under Reaction Products
Jan-04	Legal	Review of Final RI/BRA, request submission of Draft RAW	Barbara Cook	Reaction Products	DTSC file room under Reaction Products
Mar-04	Report	Draft Removal Action Workplan	CSS	DTSC	DTSC file room under Reaction Products
Aug-04	Report	Draft Removal Action Workplan Revised	CSS	DTSC	DTSC file room under Reaction Products
Nov-05	Report	Removal Action Workplan (This document)	CSS	DTSC	DTSC file room under Reaction Products

TABLES

Table 1: Results of General Parameters and Field Measurements for Groundwater Samples

Sample ID	Sample Date	Sample Depth feet	Chloride mg/L	Nitrate mg/L	Sulfate mg/L	Sulfide mg/L	TOC mg/L	Methane ug/ml	Iron mg/L	TDS mg/L	Temp* deg F	pH*	DO_2* mg/L	ORP* mV
MW-RP1	1/4/2002	8-21.5	NA	<0.10	120	<1.0	17	0.044	<0.20	2100	58.1	6.17	0.70	102
MW-RP2	1/4/2002	13.5-22	NA	<0.10	81	<1.0	5	0.012	<0.20	1300	61.8	6.82	1.35	150
MW-HLA3	1/4/2002	10-21	NA	<0.10	120	<1.0	5.2	0.096	<0.20	1500	54.2	6.78	1.50	356
38A	12/20/2001	35?-49.6	1300	<1.0	140	<1.0	6.8	0.027	<0.20	4100	57.4	10.54	1.92	-81
RP-9-W	1/3/2002	3-12	NA	NA	NA	NA	NA	NA	NA	610	NA	NA	NA	NA
RP-17-W	1/3/2002	1-7.5	NA	NA	NA	NA	NA	NA	NA	430	NA	NA	NA	NA
RP-15A-W	1/3/2002	32-36	NA	NA	NA	NA	NA	NA	NA	9400	NA	NA	NA	NA
RP-15A-W-D	1/3/2002	32-36	NA	NA	NA	NA	NA	NA	NA	8000	NA	NA	NA	NA
RP-11-W	1/2/2002	0.8-7.5	NA	NA	NA	NA	NA	NA	NA	420	NA	NA	NA	NA
RP-12-W	1/2/2002	0.8-7.5	NA	NA	NA	NA	NA	NA	NA	420	NA	NA	NA	NA
RP-13-W	1/2/2002	0.8-7.5	NA	NA	NA	NA	NA	NA	NA	360	NA	NA	NA	NA
RP-15-W	1/2/2002	4.5-10	NA	NA	NA	NA	NA	NA	NA	1200	NA	NA	NA	NA
RP-18-W	1/2/2002	1-7.5	NA	NA	NA	NA	NA	NA	NA	1500	NA	NA	NA	NA
RP-10-W	5/28/2002	7.7-16	NA	NA	NA	NA	NA	NA	NA	1500	NA	NA	NA	NA
RP-10-W-D	5/28/2002	7.7-16	NA	NA	NA	NA	NA	NA	NA	1500	NA	NA	NA	NA
RP-14-W	5/28/2002	11.2-16	NA	NA	NA	NA	NA	NA	NA	770	NA	NA	NA	NA
RP-14A-W	5/28/2002	28-32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LEGEND

TPH-G: Total Petroleum Hydrocarbons as Gasoline

TDS: Total Dissolved Solids
TOC: Total Organic Carbon
DO_2: Dissolved Oxygen
ORP: Oxidation / Reduction Potential

RP-14A, RP-15A, 38A - Samples collected from A-zone,
all others are of shallow groundwater
MW-RP1, MW-RP2, MW-HLA3, 38A - Samples collected from monitoring wells,
all others are of grab-groundwater samples collected from borings

ug/L: Micrograms per liter
mg/L: Milligram per liter
ug/ml: Microgram per milliliter
mV: Millivolt
NA: Sample Not Analyzed
* Analysis performed in field on 12/21/01 by CSS Environmental
except Well 38A sampled by Field Solutions on 12/20/01
-D: Denotes duplicate sample

Table 2A: Results of Hazardous Material Testing for Soil Samples

Sample ID	Sample Date	Sample Depth (feet)	TPH-G	Benzene	1,2-DCA	1,1-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	TCE	1,1,1-TCA	VC
			mg/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
RP-9-1.5[a]	1/3/2002	1.5	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RP-9-3.5[a]	1/3/2002	3.5	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RP-17-3.5[a]	1/3/2002	3.5	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RP-11-3.5[a]	1/2/2002	3.5	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RP-12-3.5[a]	1/2/2002	3.5	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RP-13-3.5[a]	1/2/2002	3.5	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RP-18-3.5[a]	1/2/2002	3.5	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RP-15-4[b]	1/2/2002	4.0	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RP-15-5[b]	1/2/2002	5.0	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RPHA-1-1.5[a]	4/19/2002	1.5	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RPHA-2-2[a]	4/19/2002	2.0	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RPHA-3-2[a]	4/19/2002	2.0	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RP-14-5.5[b]	5/28/2002	5.5	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RP-14-10.5[b]	5/28/2002	10.5	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RP-10-7.5[a]	5/28/2002	7.5	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
RP-10-7.7[a]	5/28/2002	7.7	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

LEGEND

TPH-G:	Total Petroleum Hydrocarbons as Gasoline
1,2-DCA:	1,2-Dichloroethane
1,1-DCA:	1,1-Dichloroethane
1,1-DCE:	1,1-Dichloroethene
cis-1,2-DCE:	cis-1,2-Dichloroethene
trans-1,2-DCE:	trans-1,2-Dichloroethene
TCE:	Trichloroethene
1,1,1-TCA:	1,1,1-Trichloroethane
VC:	Vinyl chloride
NA:	Not Analyzed

ug/Kg:	Micrograms per Kilogram
a	Sample analyzed for Halogenated Volatile Organic Compounds by 8021 or 8260
b	Sample analyzed for Volatile Organic Compounds by 8260
c	Hydrocarbon reported does not match the laboratory's standard for that fuel

Table 2B: Weiss Associates Results of Hazardous Material Testing for Soil Samples

Sample ID	Sample Date	1,1-DCE	TCE	VC	cis-1,2-DCE	trans-1,2-DCE	1,1-DCA	1,2-DCA	TMTHF
		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
RP1-4.0	4/20/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP1-6.5	4/20/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.020
RP1-9.0	4/20/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.021	0.030
RP2-3.0	4/21/1992	<0.005	0.051	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP2-9.0	4/21/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP3-4.0	4/20/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP3-8.5	4/20/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP4-4.5	4/24/1992	0.063	140	<0.005	3.9	0.030	1.5	0.012	<0.01
RP4-10.0	4/24/1992	0.036	0.69	<0.005	0.16	0.005	0.026	0.011	<0.01
RP5-3.5	4/24/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP5-7.5	4/21/1992	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP5-11.5	4/23/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.01
RP6-3.0	4/24/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP6-7.0	4/24/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP6-7.0	4/24/1992	<0.005	0.010	<0.005	<0.005	0.042	<0.005	<0.005	<0.01
RP6-10.5	4/24/1992	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP6-13.0	4/24/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP6-16.0	4/24/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP6-19.0	4/24/1992	<0.005	0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP6-21.5	4/24/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP6-24.0	4/24/1992	<0.005	0.008	<0.005	0.007	<0.005	<0.005	<0.005	<0.01
RP6-28.0	4/24/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP7-4.0	4/23/1992	<0.005	0.032	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP7-8.0	4/23/1992	<0.005	0.036	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP7-14.5	4/24/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.01
RP8-4.0	4/23/1992	<0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP8-7.5	4/23/1992	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP8-9.0	4/23/1992	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
RP8-14.0	4/24/1992	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.01
RP8-18.5	4/24/1992	0.024	530	<0.005	0.032	<0.005	0.020	<0.005	<0.01

LEGEND

1,2-DCE: 1,2-Dichloroethene
1,1-DCE: 1,1-Dichloroethene
TCE: Trichloroethene
VC: Vinyl chloride
cis-1,2-DCE: cis-1,2-Dichloroethene
trans-1,2-DCE trans-1,2-Dichloroethene
1,1-DCA: 1,1-Dichloroethane
1,2-DCA: 1,2-Dichloroethane
TMTHF: Tetramethyltetrahydrofuran

NA: Not Analyzed
mg/Kg: Milligrams per Kilogram

Note: Data compiled from Weiss Associates "Ground Water Protection Study" December 4, 1996

Table 3A: Results of Hazardous Materials Testing for Reaction Products Groundwater Samples

Sample ID	Sample Date	Sample Depth feet	TPH-G ug/L	Benzene ug/L	1,2-DCA ug/L	1,1-DCA ug/L	1,1-DCE ug/L	cis-1,2-DCE ug/L	trans-1,2-DCE ug/L	TCE ug/L	1,1,1-TCA ug/L	VC ug/L
MW-RP1[a]	1/4/2002	8-21 5	NA	NA	970	<10	<10	<10	<10	<10	<10	<10
	1/19/2005	8-21 5	NA	NA	700	<13	<13	<13	<13	<13	<13	<13
	2/3/2006	8-21.5	NA	NA	420	<2 5	<2 5	<2 5	<2 5	<2 5	<2 5	<2 5
MW-RP2[b]	1/4/2002	13.5-22	<50	<0 5	<0 5	<0.5	<0 5	<0.5	<0.5	<0.5	<0 5	<0.5
MW-HLA3[b]	1/4/2002	10-21	<50	<0.5	<0 5	4 1	4 1	7 1	1.2	38	<0 5	4.9
	2/3/2006	10-21	NA	NA	<0 5	2.1	1.7	9.5	<0 5	17	<0 5	0.77
W-23	1/19/2005	10?-25?	NA	NA	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5
W-26	1/19/2005	10-25	NA	NA	140	<2.5	<2.5	<2.5	<2.5	<2.5	<2 5	<2.5
38A[b]	12/20/2001	35?-49 6	<50	4.5	1.8	12	7.7	6 5	0.76	59	<0 5	5.7
RP-9-W[a]	1/3/2002	3-12	NA	NA	<0 5	<0 5	<0 5	3.1	<0 5	<0 5	<0 5	<0 5
RP-17-W[a]	1/3/2002	1-7 5	NA	NA	<0 5	<0.5	<0.5	<0 5	<0.5	<0 5	<0.5	<0.5
RP-15-W[b]	1/2/2002	4 5-10	<50	<2.0	<2.0	18	11	110	3.8	110	4 8	28
RP-15A-W[b]	1/3/2002	32-36	<2500	<500	<500	<500	10 000	<500	<500	53 000	<500	<500
RP-15A-W-D[b]	1/3/2002	32-36	<2500	<1000	<1000	<1000	13,000	<1000	<1000	59,000	<1000	<1000
RP-11-W[a]	1/2/2002	0 8-7 5	NA	NA	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5
RP-12-W[a]	1/2/2002	0 8-7 5	NA	NA	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5
RP-13-W[a]	1/2/2002	0.8-7.5	NA	NA	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5
RP-18-W[a]	1/2/2002	1-7 5	NA	NA	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5
RP-14-W	5/28/2002	11.2-16	<50	<0 5	<0 5	<0.5	<0 5	<0 5	<0 5	<0.5	<0 5	<0.5
RP-14A-W	5/28/2002	28-32	600[c]	<10	<10	89	160	240	<10	1,900	<10	<10
RP-10-W[a]	5/28/2002	7 7-16	NA	NA	25	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5
RP-10-W-D[a]	5/28/2002	7.7-16	NA	NA	27	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RBSL - DW			*100*	*1.0*	*0.50*	*5.0*	*6.0*	*6.0*	*10*	*5.0*	*62.0*	*0.50*
RBSL - NON-DW			*500*	*46*	*420 (910)*	*47*	*9.6 (25)*	*590*	*590*	*360*	*62*	*4.9 (782)*

Note:
Testing for the above samples was performed by CSS Environmental Services as part of the site Remedial Investigation

LEGEND

TPH-G:	Total Petroleum Hydrocarbons as Gasoline
1 2-DCA:	1 2-Dichloroethane
1 1-DCA:	1 1-Dichloroethane
1 1-DCE:	1,1-Dichloroethene
cis-1,2-DCE:	cis-1 2-Dichloroethene
trans-1,2-DCE:	trans-1,2-Dichloroethene
TCE:	Trichloroethene
1 1 1-TCA:	1,1,1-Trichloroethane
VC:	Vinyl chloride
RBSL - DW	Risk Based Screening Level where groundwater is a current or potential source of drinking water
RBSL - NON-DW	Risk Based Screening Level where groundwater is not a current or potential source of drinking water
RP-14A RP-15A 38A	- Samples collected from A-zone, all others are of shallow groundwater
MW-RP1 MW-RP2	MW-HLA3, 38A - Samples collected from monitoring wells, all others are of grab-groundwater samples collected from borings

ug/L:	Micrograms per liter
a	Sample analyzed for Halogenated Volatile Organic Compounds by 8021 or 826
b	Sample analyzed for Volatile Organic Compounds by 8260
c	Hydrocarbon reported does not match the laboratory's standard for that fuel
( )	Parentheses indicate value for soils predominantly fine-grained
-D:	Denotes duplicate sample

Table 3B: Historical Results of Selected Compounds in Groundwater Monitoring Well Samples on or near Reaction Products

Sample ID	Sample Date	1,2-DCE	1,1-DCE	TCE	VC	cis-1,2-DCE	trans-1,2-DCE	1,1-DCA	1,2-DCA	TMTHF	PCE
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
W-13	8/10/1987	NA	<10	<10	<10	NA	<10	<10	<10	20	<10
	1/1/1988	NA	<1	<1	<1	NA	<1	<1	<1	74	<1
	4/27/1988	NA	<1	<1	<1	NA	<1	<1	<1	34	<1
	4/30/1990	<5	<5	<5	<10	NA	<5	<5	<5	7	<5
	12/19/2001	NA	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	5	<0 5
	1/23/2003	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5
W-14	8/10/1987	NA	<1	<1	<1	NA	<1	<1	<1	3	<1
	1/1/1988	NA	<1	<1	<1	NA	<1	<1	<1	2	<1
	4/27/1988	NA	<1	<1	<1	NA	<1	<1	<1	3	<1
	1/23/2003	NA	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5
W-15	1/20/1987	NA	<1	3.4	<1	NA	1 3	<1	<1	<10	<1
	8/10/1987	NA	<1	<1	<1	NA	<1	<1	<1	50	<1
	1/1/1988	NA	<1	<1	<1	NA	<1	<1	<1	39	<1
	4/27/1988	NA	<1	<1	<1	NA	<1	<1	<1	120	<1
	4/30/1990	<5	<5	<5	<10	NA	NA	<5	<5	130	<5
	10/22/1991	<5	<5	<5	<10	NA	NA	<5	<5	260	<5
	1/1/1992	<5	<5	<5	<10	NA	NA	<5	<5	1200	<5
	4/1/1992	<5	<5	<5	<10	NA	NA	<5	<5	130	<5
	7/1/1992	<5	<5	<5	<10	NA	NA	<5	<5	200	<5
	10/1/1992	<5	<5	<5	<10	NA	NA	<5	<5	320	<5
	1/25/1994	<5	<5	<5	<10	NA	NA	<5	<5	94	<5
	4/27/1994	<5	<5	<5	<10	NA	NA	<5	<5	63	<5
	7/25/1994	<5	<5	<5	<10	NA	NA	<5	<5	98	<5
	10/12/1994	<5	<5	<5	<10	NA	NA	<5	<5	110	<5
	4/5/1995	NA	<5	<5	<10	<5	<5	<5	<5	29	<5
	7/6/1995	NA	<5	<5	<10	<5	<5	<5	<5	52	<5
	10/5/1995	NA	<5	<5	<10	<5	<5	<5	<5	88	<5
	12/19/2001	NA	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	5	<0 5
	1/28/2003	NA	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5
W-22	2/1/1986	NA	310	2800	190	NA	310	360	NA	NA	NA
	1/20/1987	NA	320	5100	810	NA	1,400	1100	<10	<50	<10
	4/27/1987	NA	210	1500	200	NA	390	270	<1	<10	<1
	8/10/1987	NA	170	1700	450	NA	550	500	<20	<20	<20
	1/1/1988	NA	350	3500	930	NA	1 400	1100	<25	<25	<25
	4/29/1988	NA	300	3100	680	NA	1,200	970	<20	<20	<20
	4/30/1990	430	280	1600	<10	NA	NA	310	<5	10	<5
	10/22/1991	1100	390	32	950	NA	NA	750	<25	<25	<25
	1/1/1992	980	370	3100	570	NA	NA	620	17	<5	<5
	4/1/1992	910	600	3900	850	NA	NA	460	<5	<5	<5
	7/1/1992	620	360	2700	280	NA	NA	350	<5	<5	<5
	10/1/1992	570	240	2000	340	NA	NA	<50	340	<50	<50
	1/25/1994	860	350	2500	690	NA	NA	450	<5	<5	<5
	4/29/1994	1100	490	3800	570	NA	NA	420	<5	<5	<5
	7/25/1994	1000	500	4300	540	NA	NA	460	<5	<5	<5
	10/14/1994	870	<500	2200	<1000	NA	NA	<500	<500	<500	<500
	1/6/1995	<5	<5	26	<10	8.9	<5	<5	<5	<5	<5
	4/6/1995	NA	790	4400	750	1400	<125	550	<125	<125	<125
	7/7/1995	NA	510	3200	340	1300	86	440	<5	<5	<5
	10/6/1995	NA	480	3800	570	1100	85	490	<50	<50	<50
	12/19/2001	<8.3	300	840	610	2600	340	730	<8 3	<8 3	<8 3
	1/28/2003	NA	200	410	300	2200	340	470	<8 3	<8 3	<8 3
W-23	10/22/1991	1200	<5	<5	<10	NA	NA	<5	<5	<5	<5
	1/1/1992	380	<5	22	<10	NA	NA	<5	<5	<5	21
	4/1/1992	360	<5	21	<10	NA	NA	<5	<5	<5	22
	7/1/1992	520	<5	41	15	NA	NA	<5	<5	<5	34
	10/1/1992	430	<5	26	<10	NA	NA	<5	<5	<5	23
	1/25/1994	230	<5	11	<10	NA	NA	<5	<5	<5	10
	4/27/1994	10	<5	<5	<10	NA	NA	<5	<5	<5	<5
	7/22/1994	480	<5	23	<5	NA	NA	<5	<5	<5	20
	10/12/1994	270	<5	17	6	NA	NA	<5	<5	<5	13
	1/6/1995	<5	<5	15	<10	250	5 2	<5	<5	<5	<5
	4/6/1995	NA	<5	<5	<10	18	<5	<5	<5	<5	<5
	7/7/1995	NA	<5	22	<10	310	<5	<5	<5	<5	21
	10/6/1995	NA	<5	12	<10	190	<5	<5	<5	<5	11
	1/19/2005	NA	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5
W-25	10/21/1991	<5	<5	<5	<10	NA	NA	<5	<5	17	<5
	1/1/1992	<5	<5	<5	<10	NA	NA	<5	<5	10	<5
	7/1/1992	<5	<5	12	<10	NA	NA	<5	<5	<5	8 3
	10/5/1995	NA	<5	<5	<10	<5	<5	<5	<5	22	<5
	12/20/2001	NA	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<5	<0 5
	1/22/2003	NA	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	0 7	<0 5
W-26	10/22/1991	<5	<5	<5	<10	NA	NA	<5	1800	<5	<5
	1/1/1992	<5	<5	<5	<10	NA	NA	<5	1200	<5	<5
	4/1/1992	<5	<5	<5	<10	NA	NA	<5	3300	<5	5.2
	7/1/1992	<5	<5	<5	<10	NA	NA	<5	1300	<5	93
	10/1/1992	<5	<5	<5	<10	NA	NA	<5	1400	<5	<5
	1/20/1994	<5	<5	<5	<10	NA	NA	<5	720	<5	<5
	4/29/1994	<5	<5	<5	<10	NA	NA	<5	1400	<5	<5
	7/22/1994	<5	<5	<5	<10	NA	NA	<5	690	<5	<5
	10/12/1994	<5	<5	<5	<10	NA	NA	<5	1100	<5	<5
	1/6/1995	<5	<5	<5	<10	<5	<5	<5	970	<5	<5
	4/5/1995	NA	<5	<5	<10	<5	<5	<5	810	<5	<5
	7/6/1995	NA	<5	<5	<10	<5	<5	<5	670	<5	<5
	10/6/1995	NA	<5	<5	<10	<5	<5	<5	7	<5	<5
	1/19/2005	NA	<2 5	<2 5	<2 5	<2 5	<2 5	<2 5	140	<2.5	<2 5
	2/3/2006	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	110	NA	<0.5

Table 3B (Cont.): Historical Results of Selected Compounds in Groundwater Monitoring Well Samples on or near Reaction Products

Sample ID	Sample Date	1,2-DCE ug/L	1,1-DCE ug/L	TCE ug/L	VC ug/L	cis-1,2-DCE ug/L	trans-1,2-DCE ug/L	1,1-DCA ug/L	1,2-DCA ug/L	TMTHF ug/L	PCE ug/L
W-26A	10/22/1991	<5	<5	<5	<10	NA	NA	<5	17	<5	<5
	1/1/1992	<5	<5	<5	<10	NA	NA	<5	15	6	<5
	4/1/1992	<5	<5	<5	<10	NA	NA	<5	5.1	<5	<5
	7/1/1992	<5	<5	<5	<10	NA	NA	<5	7.5	6	<5
	10/1/1992	<5	<5	<5	<10	NA	NA	<5	10	<5	<5
	1/6/1995	<5	<5	<5	<10	<5	<5	<5	8.6	<5	<5
	4/5/1995	NA	<5	<5	<10	<5	<5	<5	11	<5	<5
	7/6/1995	NA	<5	<5	<10	<5	<5	<5	13	<5	5.8
	10/6/1995	NA	<5	<5	<10	<5	<5	<5	6.8	<5	<5
	12/17/2001	4.3	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	4.3	<5	<0.5
	1/23/2003	NA	<0.5	2	<0.5	1.4	<0.5	<0.5	6.3	<0.5	0.6
W-27	10/22/1991	220	<5	5.6	20	NA	NA	<5	<5	<5	8.9
	1/1/1992	140	5.2	<5	<10	NA	NA	<5	<5	<5	<5
	4/1/1992	220	<5	6.1	<10	NA	NA	<5	<5	<5	9.6
	7/1/1992	120	<5	13	<10	NA	NA	<5	<5	<5	8.2
	10/1/1992	100	<5	<5	<10	NA	NA	<5	<5	<5	6.4
	1/20/1994	34	<5	<5	<10	NA	NA	<5	<5	<5	<5
	2/24/1994	25	<5	<5	<10	NA	NA	<5	<5	<5	<5
	4/27/1994	32	<5	<5	<10	NA	NA	<5	<5	<5	<5
	7/22/1994	42	<5	<5	<10	NA	NA	<5	<5	<5	<5
	10/12/1994	34	<5	<5	<10	NA	NA	<5	<5	<5	<5
	1/6/1995	<5	<5	<5	<10	42	<5	<5	<5	<5	<5
	4/5/1995	NA	<5	<5	12	120	<5	<5	<5	<5	<5
	7/6/1995	NA	<5	<5	13	130	<5	<5	<5	<5	<5
	10/6/1995	NA	<5	<5	11	130	<5	<5	<5	<5	<5
W-28	1/1/1992	<5	<5	<5	<10	NA	NA	<5	<5	220	<5
	4/1/1992	<5	<5	<5	<10	NA	NA	<5	<5	52	<5
	7/1/1992	<5	<5	<5	<10	NA	NA	<5	<5	43	<5
	10/1/1992	<5	<5	<5	<10	NA	NA	<5	<5	57	<5
	1/20/1994	<5	<5	<5	<10	NA	NA	<5	<5	40	<5
	4/29/1994	<5	<5	<5	<10	NA	NA	<5	<5	40	<5
	7/22/1994	<5	<5	<5	<10	NA	NA	<5	<5	47	<5
	10/12/1994	<5	<5	<5	<10	NA	NA	<5	<5	56	<5
	1/6/1995	<5	<5	<5	<10	<5	<5	<5	<5	42	<5
	4/5/1995	NA	<5	<5	<10	<5	<5	<5	<5	56	<5
	7/6/1995	NA	<5	<5	<10	<5	<5	<5	<5	47	<5
	10/6/1995	NA	<5	<5	<10	<5	<5	<5	<5	50	<5
	12/19/2001	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	46	<0.5
	1/28/2003	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	76	<0.5
W-37	7/22/1994	160	10	39	32	NA	NA	21	<5	10	<5
	10/12/1994	160	9	41	53	NA	NA	21	<5	13	<5
	1/6/1995	<5	13	53	58	130	42	25	<5	<5	<5
	4/5/1995	NA	21	76	83	210	67	37	<5	13	<5
	7/6/1995	NA	18	74	75	200	62	34	<5	15	<5
	10/6/1995	NA	15	69	51	190	49	30	<5	11	<5
	12/19/2001	<0.5	3.5	14	2.1	49	15	8.7	<0.5	<5	<0.5
	1/28/2003	NA	2.6	15	2.1	35	11	6.2	<0.5	4.4	<0.5
W-38A	7/20/1994	11	11	100	11	NA	NA	22	12	<5	<5
	10/12/1994	9	10	94	<10	NA	NA	22	12	<5	<5
	7/6/1995	NA	7	76	<10	7.4	<5	17	10	<5	<5
	10/4/1995	NA	5.1	58	<10	5.2	<5	14	7.2	<5	<5
	1/22/2003	NA	2.7	32	1.5	2.7	<0.5	5.5	1.3	<0.5	<0.5
HLAW-3	1/1/1991	15	NA	120	74	NA	NA	10	NA	NA	NA
	4/1/1994	9.4	ND	70	ND	NA	NA	ND	ND	NA	ND
RP1-052	5/5/1992	NA	<5	<5	<5	<5	<5	<5	3800	<50	NA
RP2-052	5/5/1992	NA	<1	<1	<1	<1	<1	<1	<1	<10	NA
RP3-042	4/20/1992	NA	<1	<1	<1	<1	<1	<1	8	<10	NA
RP5-042	4/23/1992	NA	3	22	11	38	17	28	<1	<10	NA
RP6-042	4/24/1992	NA	1	10	6	6	4	3	<1	76	NA
RP7-042	4/24/1992	NA	<1	3	<1	<1	<1	<1	<1	<10	NA
RP8-042	4/24/1992	NA	3800	24000	66	430	50	310	5	<10	NA
RP2-042p	4/24/1992	NA	<1	55	<1	4	<1	2	<1	<10	NA
RP4-042p	4/24/1992	NA	75	22000	120	3600	46	1800	40	<10	NA
RP5-042p	4/21/1992	NA	<0.5	<0.5	<0.5	<0.5	5.4	1.5	<0.5	NA	NA
RP6-042p	4/21/1992	NA	<0.5	<0.5	<0.5	<0.5	4.2	1.2	<0.5	NA	NA
RP7-042p	4/23/1992	NA	<1	81	<1	13	<1	12	2	<10	NA
RP8-042p	4/23/1992	NA	<1	20	<1	3	<1	3	2	<10	NA

LEGEND

1,2-DCE:	1,2-Dichloroethene
1,1-DCE:	1,1-Dichloroethene
TCE:	Trichloroethene
VC:	Vinyl chloride
cis-1,2-DCE:	cis-1,2-Dichloroethene
trans-1,2-DCE:	trans-1,2-Dichloroethene
1,1-DCA:	1,1-Dichloroethane
1,2-DCA:	1,2-Dichloroethane
TMTHF:	Tetramethyltetrahydrofuran

W- Indicates Witco well
RP- Indicates Reaction Products well

ND Not Detected
NA Not Analyzed or Data Not available
ug/L: Micrograms per liter

26A, 38A - Samples collected from A-zone
all others are of shallow groundwater

Note: Data compiled from Weiss Associates Ground Water Protection Study December 4, 1996

Table 4: Results of Hazardous Materials Testing for Soil Vapor Samples

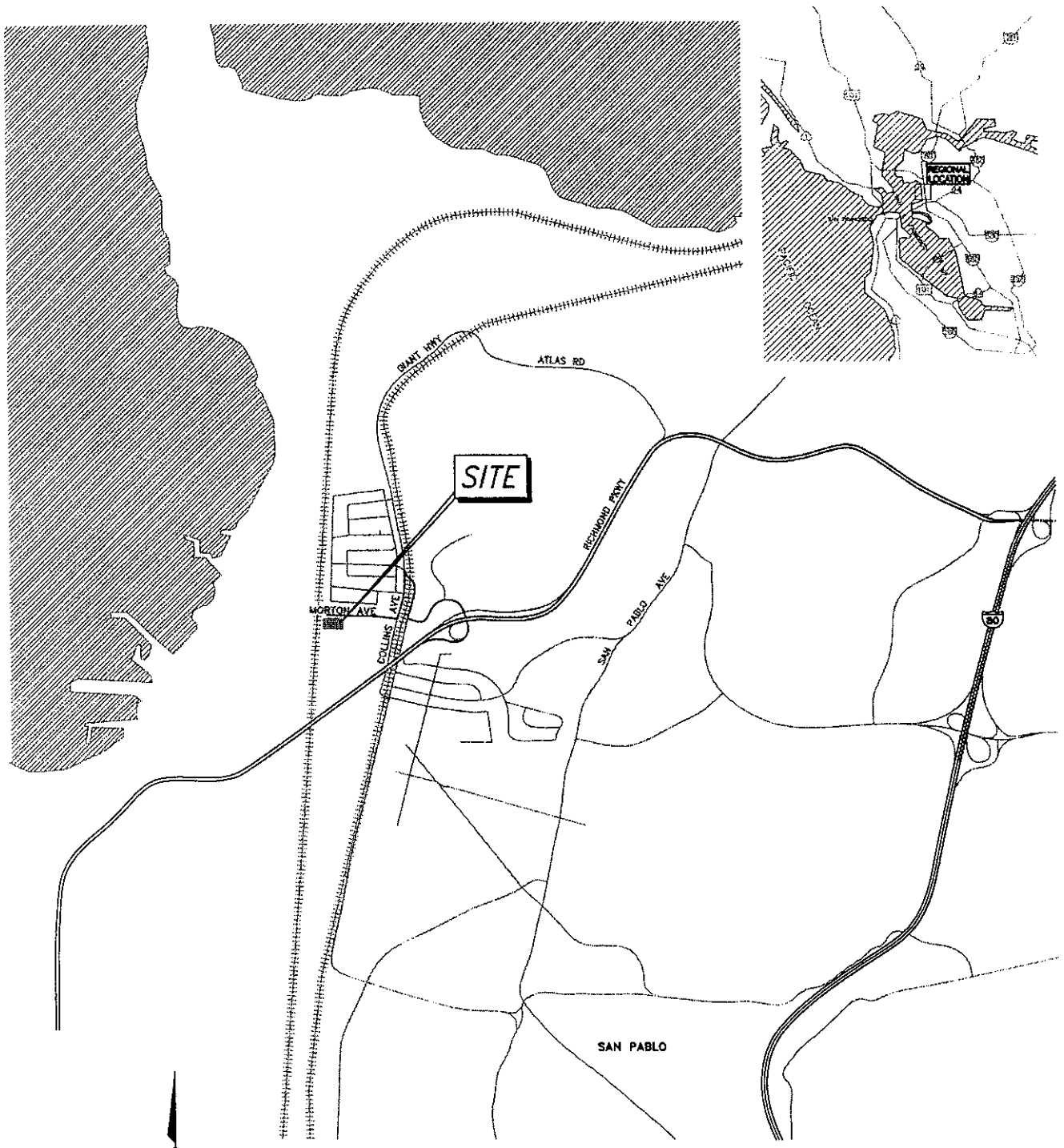
Sample ID	Sample Date	Sample Depth (feet)	Benzene ug/L	1,2-DCA ug/L	1,1-DCA ug/L	1,1-DCE ug/L	cis-1,2-DCE ug/L	trans-1,2-DCE ug/L	TCE ug/L	1,1,1-TCA ug/L	VC ug/L
RP-15-4-V[b]	5/28/2002	4.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RP-14-4-V[b]	5/28/2002	4.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RP-14-4-V-D[b]	5/28/2002	4.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RP-11-4-V[a]	5/28/2002	4.0	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RP-12-4-V[a]	5/28/2002	4.0	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RP-13-4-V[a]	5/28/2002	4.0	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RP-10-4-V[a]	5/28/2002	4.0	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RP-18-3-V[a]	5/28/2002	3.0	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RP-9-3.5-V[a]	5/28/2002	3.5	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RP-9-3.5-V-D[a]	5/28/2002	3.5	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RP-17-4-V[a]	5/28/2002	4.0	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

LEGEND

1,2-DCA:	1,2-Dichloroethane
1,1-DCA:	1,1-Dichloroethane
1,1-DCE:	1,1-Dichloroethene
cis-1,2-DCE:	cis-1,2-Dichloroethene
trans-1,2-DCE:	trans-1,2-Dichloroethene
TCE:	Trichloroethene
1,1,1-TCA:	1,1,1-Trichloroethane
VC:	Vinyl chloride
-D:	Denotes duplicate sample

ug/L:	Micrograms per liter
a	Sample analyzed for Halogenated Volatile Organic Compounds by 8021
b	Sample analyzed for Volatile Organic Compounds by 8260

FIGURES



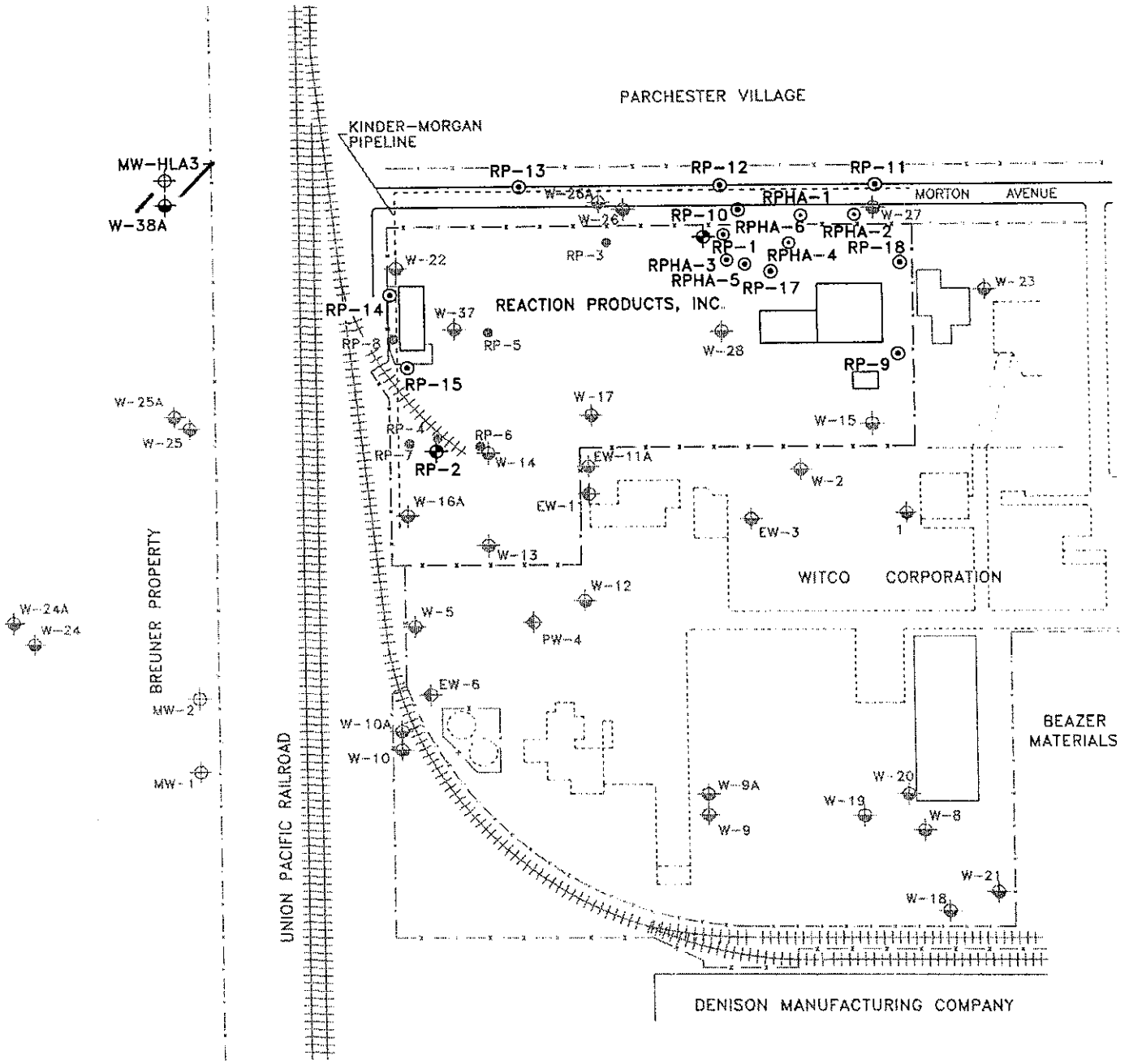
CSS

CSS ENVIRONMENTAL SERVICES, INC

REGIONAL LOCATION MAP
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

FIGURE 1

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	04/01	6103LOC	BED	00/00

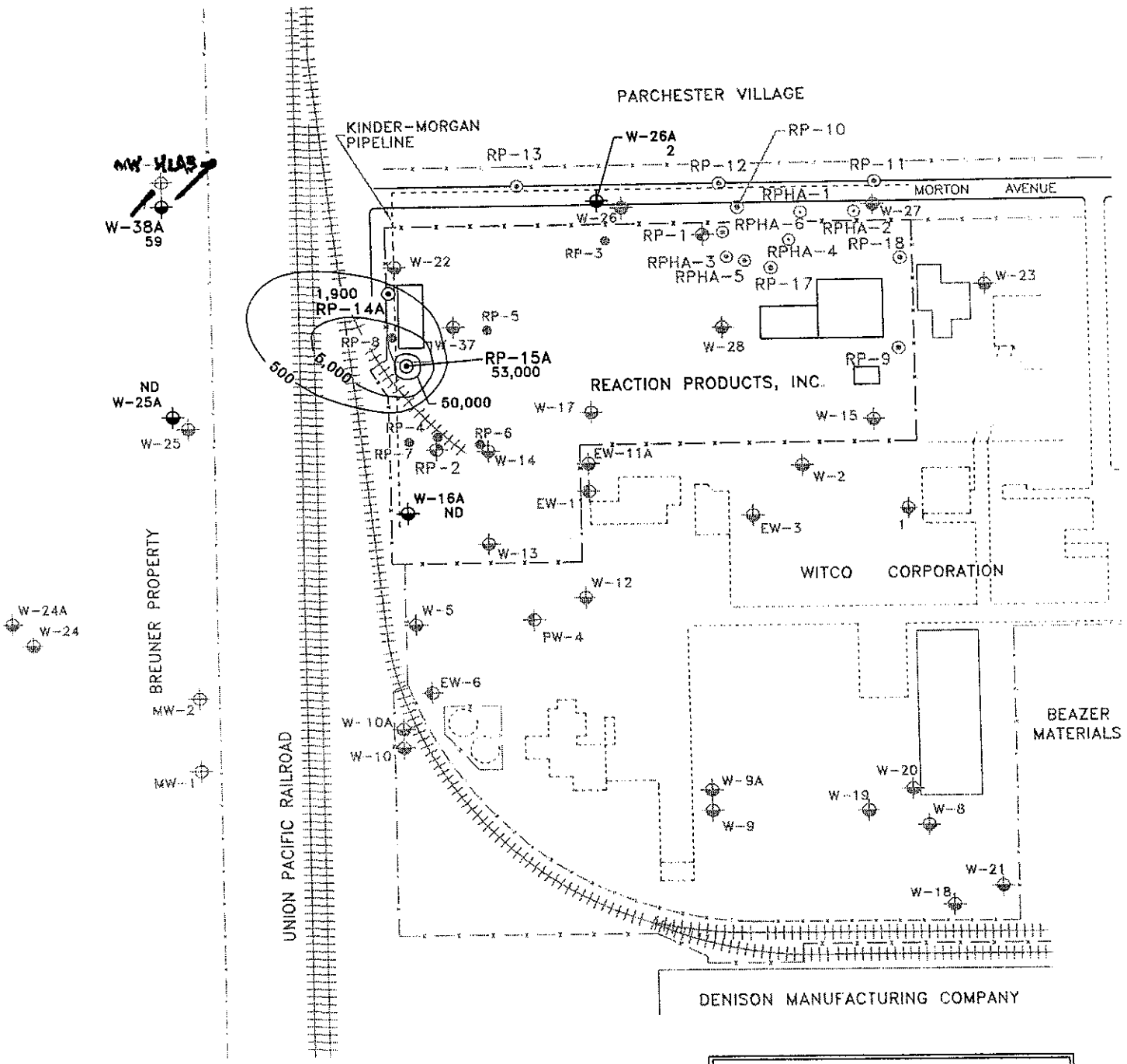


CSS ENVIRONMENTAL SERVICES, INC.

SITE PLAN
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	04/01	6103SITE	BED	4/02

FIGURE 2



LEGEND

- REMEDIAL INVESTIGATION
- REACTION PRODUCTS MONITORING WELL
- REACTION PRODUCTS BORING LOCATIONS
- BREUNER MONITORING WELL
- WITCO MONITORING WELL
- WITCO EXTRACTION WELL

* LATEST DETECTIONS & RELEVANT NON-DETECTIONS DATA FROM WITCO & CSS (ALL CONCENTRATIONS IN ug/L)

SCALE

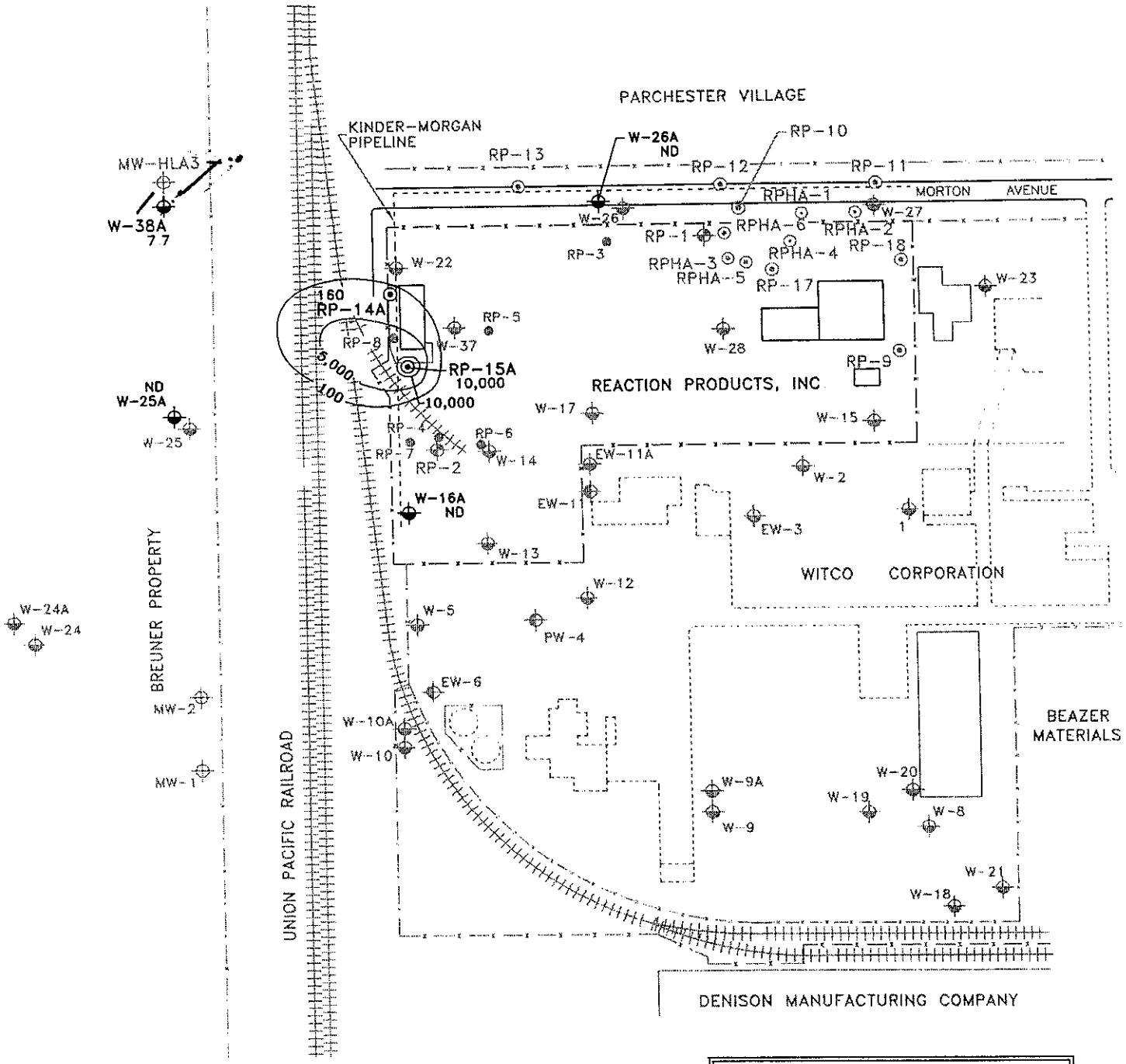
FEET 0 300 FEET

CSS ENVIRONMENTAL SERVICES, INC

TCE IN "A" ZONE GROUNDWATER ISO-CONTOUR MAP
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

FIGURE 3

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	04/01	2C A TCE	BED	07/03



LEGEND

- REMEDIAL INVESTIGATION
- REACTION PRODUCTS MONITORING WELL
- REACTION PRODUCTS BORING LOCATIONS
- BREUNER MONITORING WELL
- WITCO MONITORING WELL
- WITCO EXTRACTION WELL

* LATEST DETECTIONS & RELEVANT NON-DETECTIONS DATA FROM WITCO & CSS (ALL CONCENTRATIONS IN ug/L)

SCALE

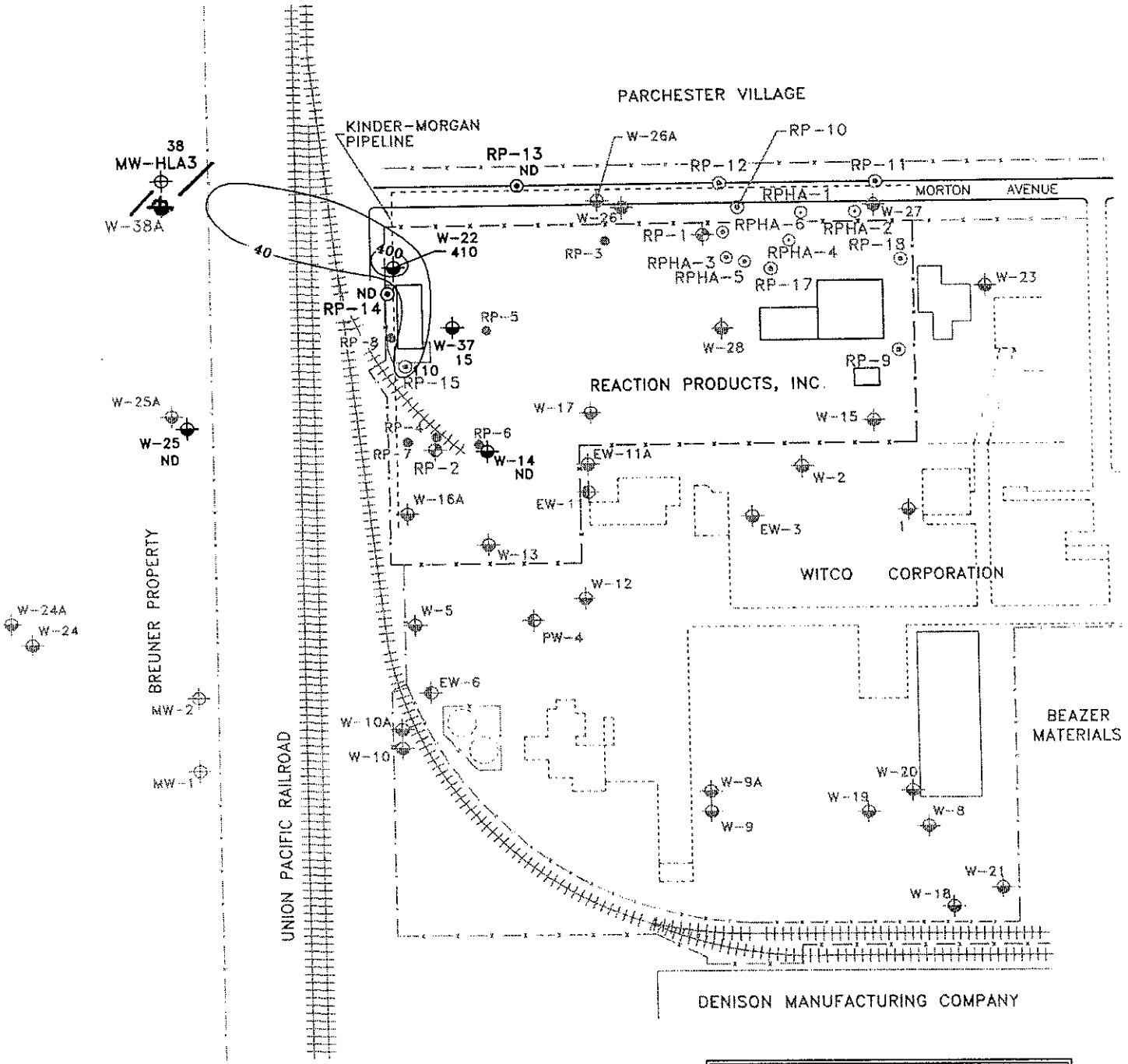
FEET 0 300 FEET

CSS ENVIRONMENTAL SERVICES, INC

1,1 DCE IN "A" ZONE GROUNDWATER ISO-CONTOUR MAP
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

FIGURE 4

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	04/01	2E A DCE	BED	07/03



LEGEND

- REMEDIAL INVESTIGATION
- REACTION PRODUCTS MONITORING WELL
- REACTION PRODUCTS BORING LOCATIONS
- BREUNER MONITORING WELL
- WITCO MONITORING WELL
- WITCO EXTRACTION WELL

* LATEST DETECTIONS & RELEVANT NON-DETECTIONS DATA FROM WITCO & CSS (ALL CONCENTRATIONS IN ug/L)

SCALE

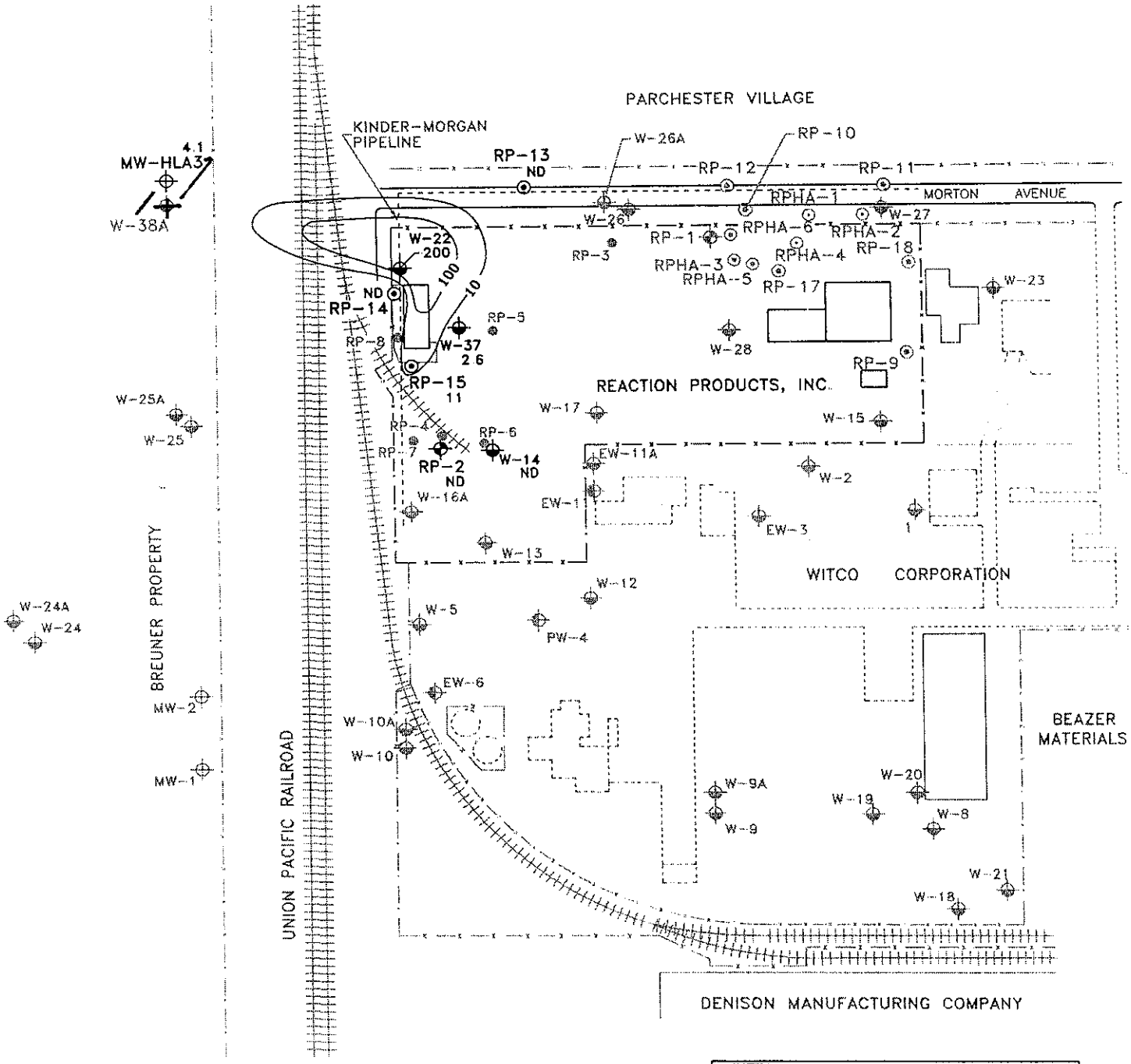
FEET 0 300 FEET

CSS ENVIRONMENTAL SERVICES, INC.

TCE IN SHALLOW GROUNDWATER ISO-CONTOUR MAP
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

FIGURE 5

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	04/01	2B SHAL...	BED	07/03



LEGEND

- REMEDIAL INVESTIGATION
- REACTION PRODUCTS MONITORING WELL
- REACTION PRODUCTS BORING LOCATIONS
- BREUNER MONITORING WELL
- WITCO MONITORING WELL
- WITCO EXTRACTION WELL

* LATEST DETECTIONS & RELEVANT NON-DETECTIONS DATA FROM WITCO & CSS (ALL CONCENTRATIONS IN ug/L)

SCALE

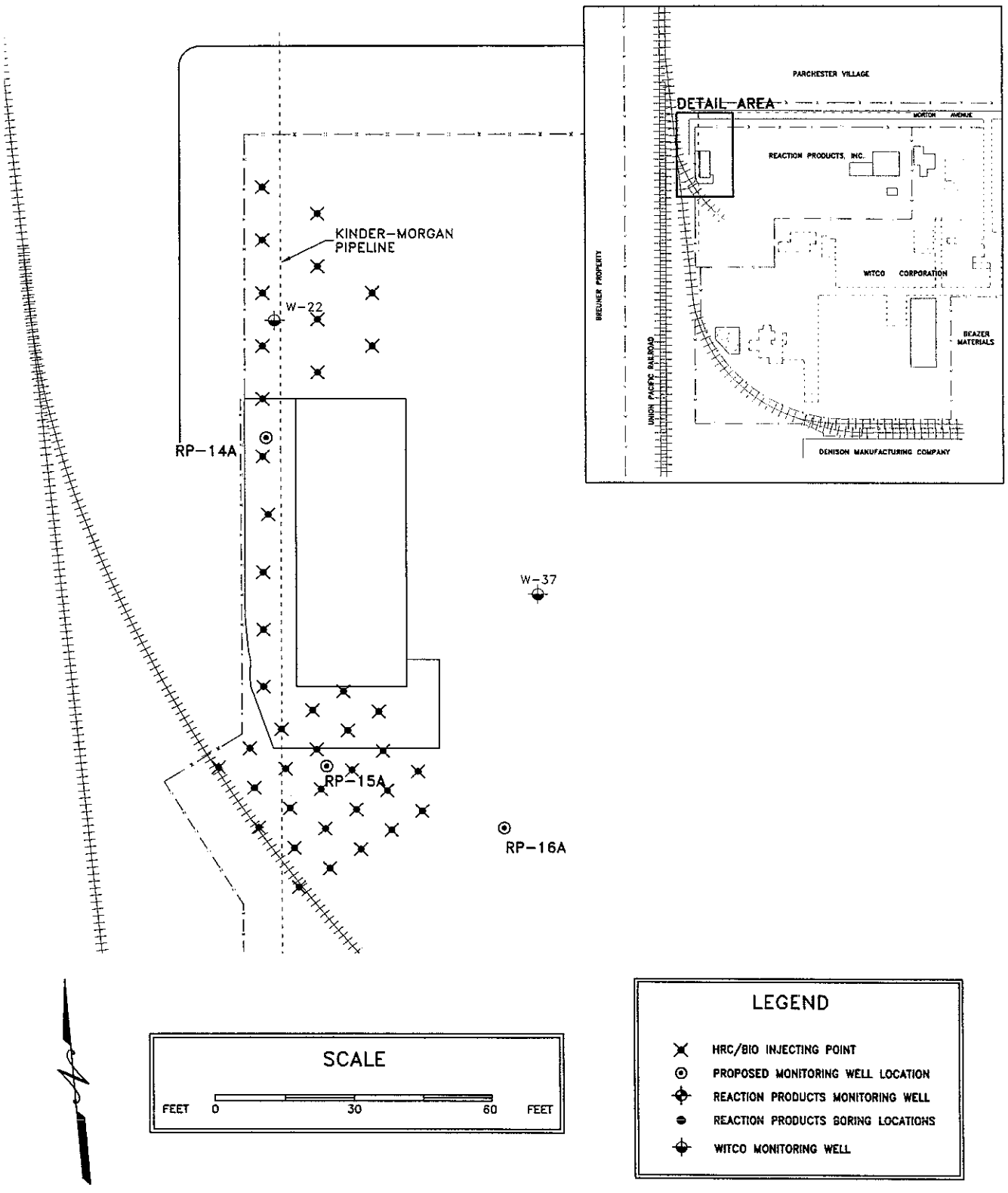
FEET 0 300 FEET

CSS ENVIRONMENTAL SERVICES, INC.

1,1 DCE IN SHALLOW GROUNDWATER ISO-CONTOUR MAP
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

FIGURE 6

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	04/01	2D SHAL.	BED	07/03

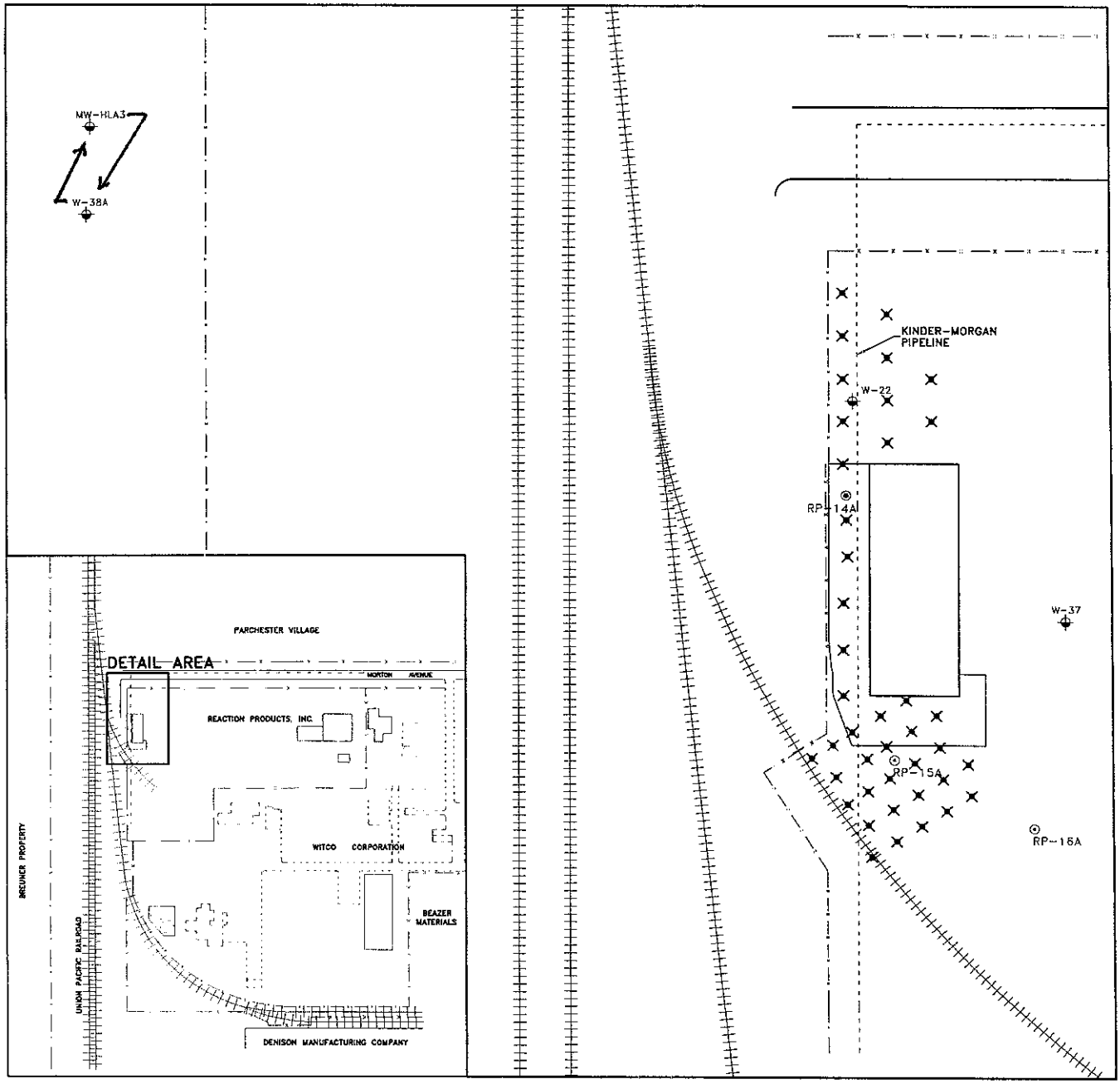


CSS ENVIRONMENTAL SERVICES, INC

HRC/BIO REMEDIATION LAYOUT
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	07/05	6103_FIG7	MJE	07/05

FIGURE 7



SCALE

FEET 0 50 100 FEET

LEGEND

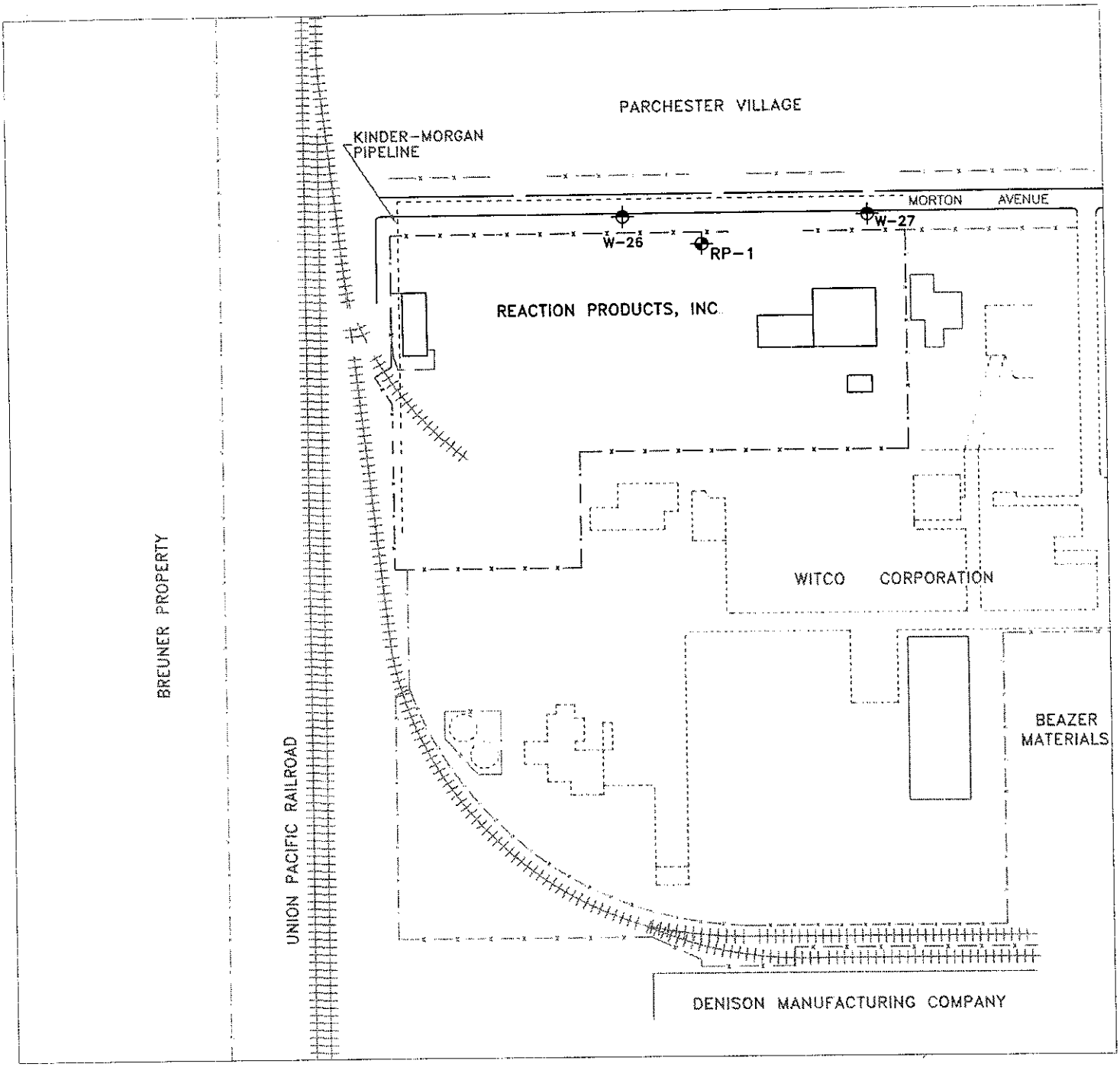
- HRC/BIO INJECTION POINT
- PROPOSED MONITORING WELL LOCATION
- REACTION PRODUCTS MONITORING WELL
- REACTION PRODUCTS BORING LOCATIONS
- WITCO MONITORING WELL

CSS ENVIRONMENTAL SERVICES, INC

HRC/BIO REMEDIATION MONITORING WELLS
SHALLOW ZONE(W-22) AND LOWER ZONE(RP-14A &15A)
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

FIGURE 8

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	05/05	6103HRC-F8	BED	05/05



SCALE

FEET 0 300 FEET

LEGEND

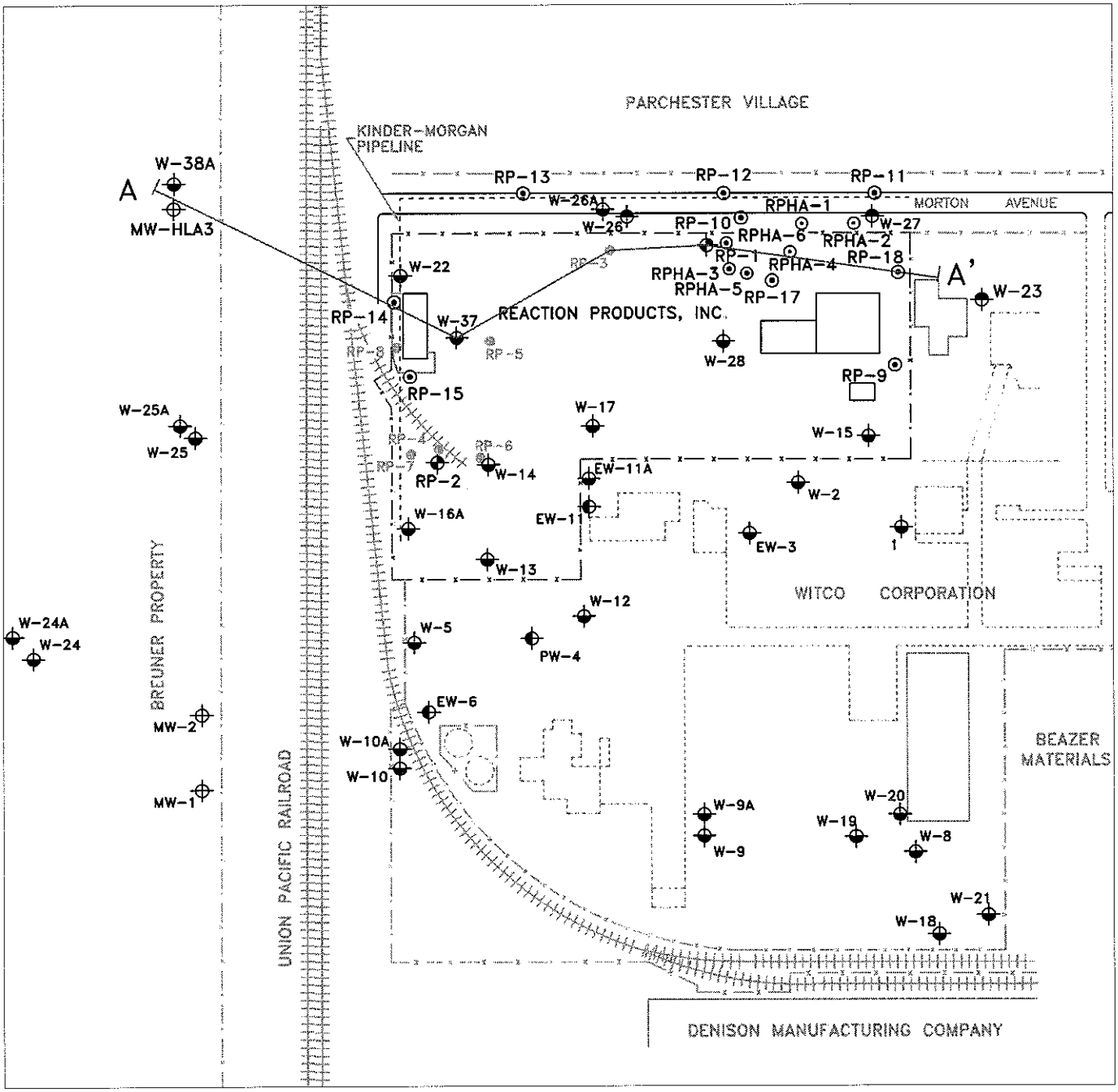
- REACTION PRODUCTS MONITORING WELL
- WELLS USED FOR REMOVAL ACTION NEAR RP-1

CSS ENVIRONMENTAL SERVICES, INC

MONITORING WELLS SELECTED FOR REMOVAL ACTION
SHALLOW WATER BEARING ZONE NEAR RP-1
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

FIGURE 9

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	04/01	6103SITE	BED	4/02



SCALE

FEET 0 300 FEET

LEGEND

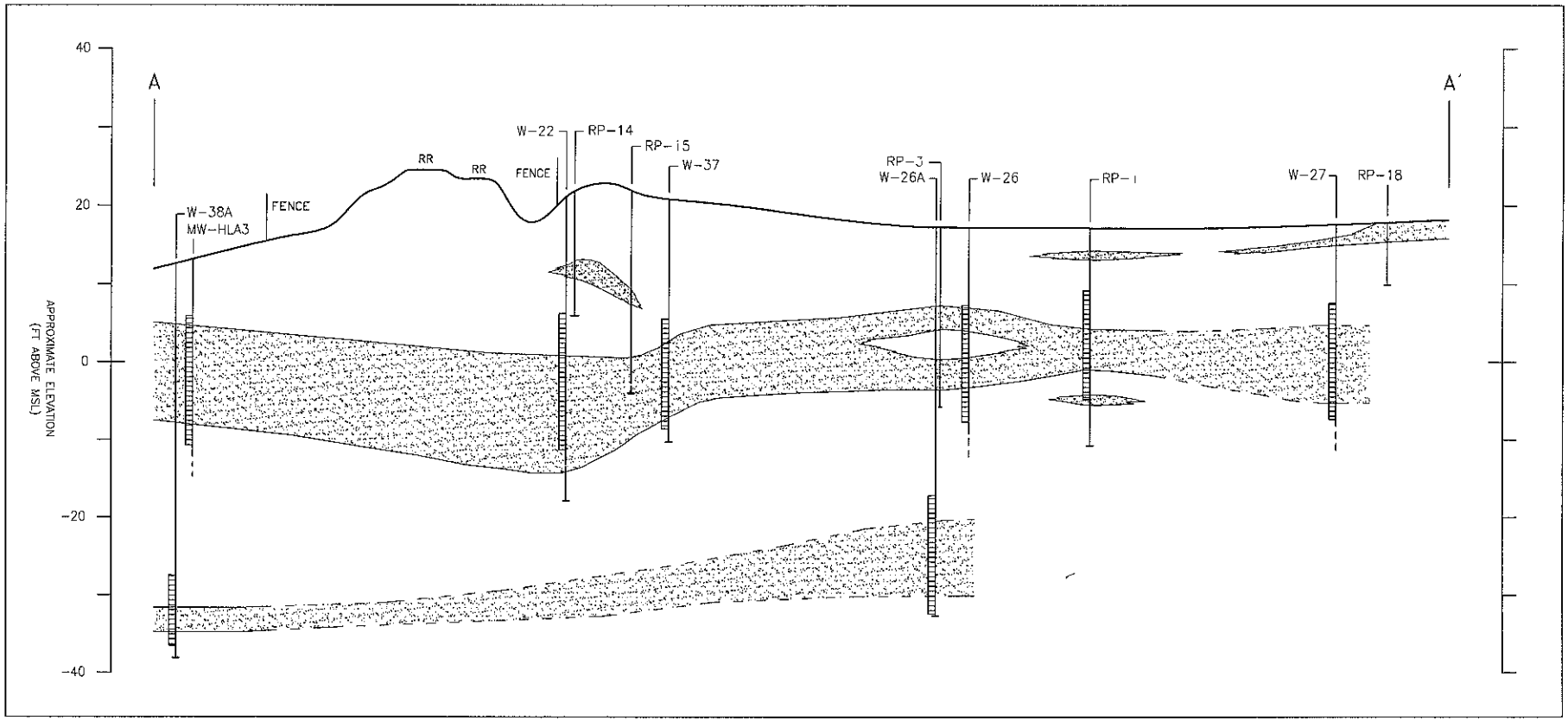
- REMEDIAL INVESTIGATION
- REACTION PRODUCTS MONITORING WELL
- REACTION PRODUCTS BORING LOCATIONS
- BREUNER MONITORING WELL
- WITCO MONITORING WELL
- WITCO EXTRACTION WELL

CSS ENVIRONMENTAL SERVICES, INC.

SITE PLAN AND LOCATION OF CROSS SECTIONS
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

FIGURE 10

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	04/01	6103SITE	BED	4/06



LEGEND

- SCREENED INTERVAL
- SAND
- SILT AND CLAY
- ESTIMATED BOUNDARY

HORIZ. SCALE

FEET 0 100 FEET

CSS ENVIRONMENTAL SERVICES, INC.

A – A' CROSS SECTION
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	04/01	6103SITE	BED	4/06

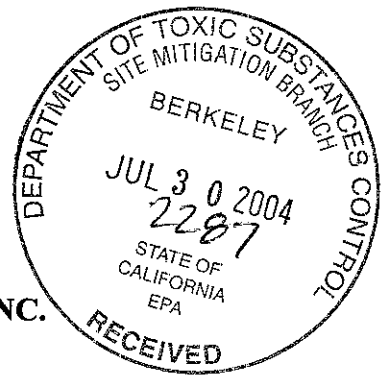
FIGURE 11

APPENDIX A
HEALTH AND SAFETY PLAN

CSS ENVIRONMENTAL SERVICES, INC.

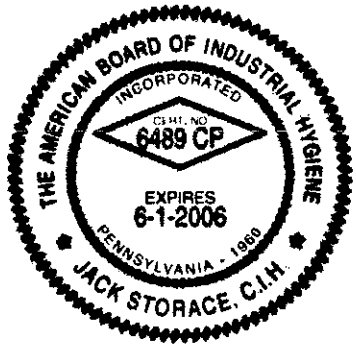
Health and Safety Plan
For the
Removal Action Workplan
Reaction Products, Inc.
840 Morton Avenue
Richmond, CA

June 2004



Prepared by

CSS ENVIRONMENTAL SERVICES, INC.
95 Belvedere Street, Suite 2
San Rafael, California 94901



Jack Storace, C.I.H.
6489 CP

CSS ENVIRONMENTAL SERVICES INC.

SITE SAFETY PLAN
TABLE OF CONTENTS

SECTION ***PAGE***

APPENDICES

1.0 PROJECT DESCRIPTION

This health and safety plan (HSP) presents the health and safety procedures associated with the removal action activities to be completed by CSS Environmental Services, Inc. (CSS) at the Reaction Products property in Richmond, California.

The purpose of the HSP is to identify and evaluate health and safety hazards at the site and prescribe control measures to be implemented. This plan includes:

- Background information related to the project
  Site hazards and hazard control measures
- Requirements for exposure monitoring, personal protective equipment (PPE), and decontamination measures
- Standard safety procedures

CSS project management and the CSS site safety officer (SSO) will implement the HSP. Compliance with this plan is required of all CSS personnel, subcontractors, and associated third parties at the site. All field personnel, subcontractors, and visitors will review the HSP prior to site work and will sign an acknowledgment form indicating that they have reviewed the plan.

The HSP may be revised and/or amended if additional information becomes available regarding the hazards present at the site or if significant changes occur in the scope of work, operational procedures, site hazards, or hazard control measures. The HSP may be modified by the SSO upon review and approval of the project manager. All field personnel will be informed of any changes to the HSP through safety meetings and written addendum's to the HSP. A copy of this HSP will be maintained onsite during work and will be available for inspection and review by site or agency personnel.

1.1 Project Description

The purpose of the removal action is to remove or destroy, through in-situ reductive dechlorination, volatile organic compounds (VOCs) from onsite impacted groundwater. VOCs have previously been detected in site and adjacent property soils and groundwater. Currently, no soil was found to be impacted; therefore, removal of VOCs will address impacted groundwater. Specifically, impacted water-bearing zones identified in the northwestern boundary of the subject site will undergo removal actions. The removal action is being performed to reduce potential exposure risks to public health and the environment. This work is being performed for the Reaction Products Co. under a regulatory Order from the California Department of Toxic Substances Control.

1.1.1 Work Tasks, Soil Media

The temporary boring installations or injections will involve boring into soil. The maximum boring depth is expected to be approximately 50 feet below ground surface. One soil core from each area (2 new monitoring well location areas) will be inspected and screened for indications of contamination.

1.1.2 Work Tasks, Groundwater Media

Groundwater will be collected from multiple monitoring wells. Purged groundwater and rinsate water may be generated and stored in drums pending characterization and disposal. Further, drum and container handling for groundwater and rinsate will be in compliance with all federal, state and local regulations.

1.1.3 Work Tasks, Soil Vapor

Soil vapors which may emanate from monitoring well installation locations will be assessed using an OVM or PID to ensure that contractors and personnel are using appropriate PPE.

1.2 Site Data Review

Others have generated numerous reports for this and neighboring properties demonstrating the presence of VOCs in soil and/or groundwater in the site vicinity. These are available at the California Department of Toxic Substances Control office in Berkeley, California. In summary, the following chemicals have been found as primary contaminants:

- Trichloroethene (TCE)
- 1,1-Dichloroethene (1,1-DCE)
- 1,2-Dichloroethane (1,2-DCA)

Secondary to the above are the following contaminants which may also be present,

- Benzene
- Chloroform
- 1,1-Dichloroethane (1,1-DCA)
- cis-1,2-Dichlroethene (cis-1,2-DCA)
- Toluene
- 1,1,1-Trichloroethane (1,1,1-TCA)
- Vinyl Chloride (VC)

1.3 Project Organization

CSS shall be responsible for health and safety conditions related to the work to be performed on this contract at the project site. CSS employees, subcontractor employees, and any others who enter the site must adhere to the provisions of this site specific HSP and any additional subcontractor's Safety and Health Program.

1.3.1 Site Safety and Health Officer

CSS shall provide a full-time on-site Site Safety Officer (SSO) during project work. The following requirements apply to the SSO:

- The SSO shall have work experience appropriate to project requirements.
- The SSO shall have two years of health and safety work experience in hazardous waste operations.
- The SSO shall have completed HazWOPER 40-hour worker, 8-hour supervisor, and 8-hour refresher (current within one year) training.
- The SSO shall be proficient in calibration and use of monitoring equipment.
- The SSO must have authority to take immediate action, including stopping work, to correct safety violations

Designated health and safety personnel are listed below.

General supervisor/SSO: Aaron Stessman, PE, REA
Responsibility and Authority: Direct all hazardous waste operations and develop and implement the site safety and health plan and verify compliance for the subject site.
Contact info: (415) 457-9551 office
(415) 948-4385 cell

SSO Alternate: Terrance Carter, PE
Responsibility and Authority: Develop and implement the site safety and health plan and verify compliance for the subject site.
Contact info: (415) 457-9551 office
(415) 948-4514 cell

Qualified and Other Personnel: Mark Erickson, Jules Sibilio, and Bruce Davis

Responsibility and Authority: Assistance with site related activities, including sampling and equipment, documenting site activities, and evaluation of soil or water lab results.
Lines of authority, responsibility and communication:
The organizational structure shall be reviewed and updated as necessary to reflect the current status of waste site operations.

All above personnel, responsibilities, and lines of authority will be conducted per 8 CCR, §5192 (b) (2).

Any proposed collateral duties of the SSO shall be addressed in a manner satisfactory to the Property Owner that will provide assurance that his/her collateral duties do not interfere with safety.

1.3.2 Safety Meetings and Inspections

No site activities will be conducted until site-specific health and safety review is completed. Only individuals who have completed the appropriate site-specific health and safety review will be allowed to perform work.

All individuals expected to work on this project shall sign the Attendance Form indicating that they have attended CSS's site-specific health and safety review including review of this HSP.

1.3.3 Daily Safety Meetings

This meeting will be conducted at the start of each shift by the SSO. The information presented will include site safety topics, special hazards relevant to current and upcoming tasks, review of near miss incidents, observation of deficiencies noted by supervisors and workers, and worker concerns.

2.0 SITE HAZARDS

Chemical hazards and physical hazards are anticipated for this project. This section describes the primary hazards.

2.1 Chemical Hazards

Table 1 below summarizes the chemical and physical characteristics, health effects, potential routes of entry, physical state expected, target organs and worker exposure limits of the chemicals that may be encountered in the performance of the work

The site safety officer will conduct exposure monitoring (described in Section 3.0) to assess personnel exposure to chemicals. As site conditions change, the site safety officer will require changes in procedure as necessary to minimize exposure of personnel to chemical hazards at the site. To minimize exposure of personnel to chemical hazards in the performance of the work, all personnel will be required to wear the appropriate personal protective equipment (described in Section 4.0), carefully follow decontamination procedures (outlined in Section 5.0), and follow general safe work practices. Personnel should avoid unnecessary contact with potentially contaminated materials.

TABLE 1
CHEMICAL HAZARD INFORMATION

COMPOUND	Exposure Limits (PEL)	ROUTE OF EXPOSURE	ACUTE SYMPTOMS	DESCRIPTION
Benzene	1.0 ppm	Inhalation/ Ingestion/ Dermal/ Eyes	Eye, skin, and respiratory irritation; Giddiness; Headache, nausea, fatigue; Bone marrow depressant	Colorless to light yellow liquid; aromatic odor
Chloroform	2 ppm	Inhalation/ Ingestion/ Dermal/Eyes	Eye, skin, Dizziness, Mental dullness, nausea, confusion, headache, fatigue, anesthesia; Liver	Colorless liquid with a pleasant odor
1,1-Dichloroethane (1,1-DCA)	100ppm	Inhalation/ Ingestion/ Dermal/ Eyes	Skin irritation; Central nervous system depression; Liver, kidney, lung damage	Colorless, oily liquid; chloroform-like odor
1,2-Dichloroethane (1,2-DCA)	1 ppm C 200ppm	Inhalation/ Ingestion/ Dermal/ Eyes	Eye irritation; Central nervous system depression; Nausea, vomiting; Liver and kidney, cardiovascular damage	Colorless liquid; pleasant chloroform-like odor
1,1-Dichloroethene (1,1-DCE)	1 ppm	Inhalation/ Ingestion/ Dermal/ Eyes	Eye, skin, and throat irritation; Dizziness, headache, nausea; Breathing difficulty; Liver and kidney dysfunction	Colorless liquid or gas; mild, sweet chloroform-like odor

cis-1,2-Dichloroethene (cis-1,2-DCE)	200 ppm	Inhalation/ Ingestion/ Dermal/ Eyes	Dermal irritation; Narcotic effects; Liver and kidney disfunction	Colorless liquid; pleasant odor
Toluene	50 ppm C 500ppm	Inhalation/ Ingestion/ Dermal/ Eyes	Eye, nose, irritation; fatigue, weakness, confusion, euphoria, dizziness, headache; dilated pupils; nervousness, muscle fatigue, insomnia; Paresthesia; dermatitis; Liver and kidney disfunction	Colorless liquid with a sweet, pungent, benzene like odor
1,1,1-Trichloroethane (1,1,1-TCA)	350 ppm C 800ppm	Inhalation/ Ingestion/ Dermal/ Eyes	Eye, skin, irritation; Headache, weakness, exhaustion; Central nervous system depression; Poor equilibrium; Cardiac arrhythmias; Liver damage	Colorless liquid; mild chloroform-like odor
Trichloroethene (TCE)	25 ppm C 300ppm	Inhalation/ Ingestion/ Dermal/ Eyes	Eye, skin, irritation; Headache; Visual disturbance, fatigue, giddiness, tremoring, sleepiness, nausea, vomiting, dermititus; Cardiac arrhythmias; Liver damage	Colorless liquid (unless dyed blue); chloroform-like odor
Vinyl Chloride	1 ppm C 5ppm	Inhalation/ Dermal/ Eyes	Weak; Abdominal pain, GI bleeding; Enlarged liver; Pallor or cyanosis of extremities; (in liquid form) frostbite	Colorless liquid

Cal OSHA Exposure limits and other pertinent information listed in the above table was abstracted from the California Code of Regulations "Calregs website". Additional information was obtained from the *NIOSH Pocket Guide to Chemical Hazards,* by U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control and Prevention, National Institute for Occupational Safety and Health, January 2003.

2.2 Physical Hazards

The primary physical hazards to be encountered during site activities are associated with:

- Vehicle and equipment traffic
- Heavy Equipment and Drilling
- Noise
- Miscellaneous physical hazards.

The following paragraphs describe the physical hazards associated with each site activity Specific precautions to prevent each hazard follow this section.

2.2.1 Vehicle and Equipment Traffic and Site Control

Site personnel that work in areas of vehicle traffic will wear orange reflective safety vests and hard hats, should the need arise. Please note that all activities performed under the RAW will be occurring onsite and no offsite activities will be necessary.

- Traffic control will not be necessary; work will not be performed in an active roadway.

Site control for the immediate work area is listed below.

- Immediate Drilling area will be coned-off and use caution tape, where appropriate, to control unauthorized personnel from entering the work zone.
- Any persons near the work area will be directed away from the work exclusion zone by the SSO or any of his authorized affiliates and be notified of all areas onsite where unauthorized personnel are restricted.

2.2.2 Heavy Equipment and Drilling

Drilling of temporary borings and monitoring well installation will be performed by a licensed C-57 driller within the property of the subject site. Site personnel will use appropriate PPE; hard hat, steel-toed boots, orange safety vests, safety glasses, respirators, etc. A complete list of PPE to be used during site remedial activities is presented in Section 4.0 of this Health and Safety Plan. A Photo-Ionization Detector (PID) will be used to screen any boring or well to determine the need for inhalation protection. Further, only qualified personnel with 40-hour hazardous waste operations training certifications will be allowed in the immediate work area, and will be under the supervision of the SSO, or any of his qualified personnel. Physical hazards associated with this activity are listed below.

- Overhead obstacles-drilling equipment
- Inhalation of vapors- as determined by PID meter
- Accidental ingestion of groundwater-not expected

Proper lock-out/block-out procedures in compliance with all applicable regulations will be observed for field maintenance and repair activities on all machinery, and hand and power tools utilized onsite.

2.2.3 Noise Exposure

Noise levels on the site may exceed the Cal OSHA standard of 85 dBA (time-weighted average for an 8-hour day), during drilling activities. Hearing protection will be provided to all exposed workers should the noise level exceed the time weighted average of 85 dBA, and access to the site will be controlled. All local noise ordinances will be followed. Ordinances include restriction of noise level to below 70 dBA at the property line of the site and a restriction of construction activities to between 7 a.m. and 5 p.m.. If sound level monitoring detects unacceptable noise levels as allowed by local ordinances, measures such as limiting construction hours will be taken. The noise generated by the construction equipment is not anticipated to exceed the above mentioned thresholds.

Control, monitoring, assessment and other elements of exposure to noise will be in compliance with 8 CCR, Article 105.

Active drilling will be performed between the hours of 8:00 am to 5:00 pm to mitigate residential noise exposure.

2.2.4 Miscellaneous Physical Hazards

Miscellaneous physical hazards and safety procedures will be discussed at the site by the site safety officer and may include review of the following:

- ☐ Material handling
- ☐ Safe lifting procedures
- ☐ Machinery operation
- ☐ Housekeeping
- ☐ Un-even terrain
- ☐ Elevated work surfaces
- ☐ Poor illumination
- ☐ Overhead obstructions
- ☐ Sharp objects
- ☐ Slip, trip and fall hazards.

3.0 EXPOSURE MONITORING

Air will be monitored, as necessary, to assess area, worker and community exposures to chemicals during various project activities, and in order to provide the site safety officer with information for making decisions regarding required personal protective equipment, etc. Please note that all air monitoring and action levels will be determined and conducted in compliance with all federal, state, and local regulations. A description of the exposure-monitoring program is provided below.

3.1 Air Contaminants

Each of the constituents listed in Table 1 is a VOC, and may be released during drilling and sampling activities. Of these compounds, benzene and vinyl chloride have the lowest 8-hour time weighted average OSHA Permissible Exposure Limit (PEL), at 1.0 ppm. The ceiling limit for vinyl chloride is 5 ppm. Of the remaining listed VOCs, the lowest PEL and/or ceiling limit is 50 ppm. Total VOCs will be monitored during activities at this site. Vinyl chloride and benzene will be monitored if total VOC concentrations are found to continuously exceed 1 ppm for 15 minutes or 5 ppm at any time during activities at this site.

3.2 Personal Monitoring

High-risk workers breathing area will be monitored at the following times during drilling activities: upon initial ground penetration, upon sample retrieval, and during boring destruction (placement of grout). The SSO may increase monitoring frequency depending on site conditions. Monitoring methods and field instrumentation is described below. Given the open air-working environment, workers should have a minimal risk of exposure provided they do not breath vapors directly from the boring.

3.3 Monitoring Methods

Total volatile organic compounds (VOCs) ambient air will be measured with a photo-ionization detector (PID). If total VOC measurements are above air monitoring action levels as measured by the PID, CSS will measure the vinyl chloride and benzene concentrations using colorimetric indicating tubes such as those produced by Dräger or MSA.

3.4 Action Levels

If VOC levels, as measured by PID, are found to exceed 1 ppm for a period of 15 minutes or 5 ppm at any time, work will stop and vinyl chloride and benzene concentrations will be measured. If benzene and vinyl chloride are not detected, action levels may be revised upward at the discretion of the SSO, but in no case in excess of 25 ppm. If benzene and/or vinyl chloride are detected at a concentration greater than 0.5 ppm or total VOCs exceed 25 ppm then Level C personal protective equipment (air purifying respirators) will be required. These action levels are

set, as a minimum, at one-half of the Cal OSHA 8-hour TWA PEL. If any personnel detect VOCs odors, the SSO will be notified and air monitoring will be performed.

4.0 PERSONAL PROTECTIVE EQUIPMENT

Based on the site contaminants and activities, level C and level D personal protective equipment (PPE) are appropriate. All PPE, including respiratory protection will be in compliance with all federal, state, and local regulations. PPE levels to be used during site activities are detailed below.

4.1 Level C PPE

Tasks: Concentration areas as instructed by the SSO.

- ☒ Half-face or full-face air-purifying respirator with Organic Vapor Cartridges as required
- ☒ Tyvek® or Kleenguard® coverall as required to protect from incidental splash
- ☒ Orange safety vest for vehicle traffic
- ☐ Steel-toe boots
- ☐ Gloves, outer (PVC or nitrile) as required
- ☐ Gloves, inner (surgical nitrile, vinyl, or latex)
- ☐ Hardhat
- ☐ Safety glasses
- ☒ Ear plugs if noise levels >85 dBA

4.2 Level D Protection

Tasks: Other field activities not involving contact with contaminated soils or groundwater.

Level D protection is worn when minimal protection is needed, and activities are not likely to involve direct contact with contaminated materials. Level D protection consists of:

- ☐ Coveralls
- ☐ Steel-toe work boots
- ☒ Gloves (cotton or leather)
- ☒ Orange traffic safety vest for vehicle traffic
- ☐ Hardhat
- ☐ Safety glasses
- ☒ Goggles (as needed)
- ☒ Ear protection (as needed)

5.0 DECONTAMINATION

Personnel decontamination procedures are outlined below.

5.1 Personnel Decontamination

Contaminated protective clothing will be decontaminated and removed. Disposable materials will be placed in plastic bags or marked containers prior to leaving the decontamination station. Reusable gear will be cleaned and decontaminated prior to reuse. Personal hygiene will be practiced by washing face, hands and forearms before lunch, food/smoke breaks, and at the end of the day. Provisions for personal hygiene include potable water for washing hands and face, and bottled water for drinking use. Portable restrooms are located at the site.

5.2 Equipment Decontamination

Drilling equipment will be decontaminated by use of high-pressure steam or alkyl-based cleaners and rinsed with clean water before equipment is reused in a different location, thus prohibiting potential cross-contamination. Drilling will first be performed in areas with lowest concentrations of Chemicals of Potential Concern (COPCs) to further assure that cross-contamination does not result. Other sampling equipment, such as, sampling bailers will be decontaminated as above and reused or disposed of properly.

6.0 GENERAL WORK PRACTICES

All work will be conducted during daylight hours or provide minimum illumination requirements specified in 8 CCR, § 5192 (m).

Personnel working on the site will work in a safe manner and abide by the following procedures.

6.1 HSP Review and Documentation

☐ Workers must review the HSP before working at the site, and personnel will sign a form documenting that they have reviewed the plan, understand the HSP requirements, and agree to follow the plan.

☐ Questions relating to the HSP will be answered by the SSO prior site work.

☐ Prior to start of work, the SSO will provide site orientation to workers related to project operations and HSP requirements and will include review of:

- ☐ Provisions of the HSP
- ☐ Site background and scope of work
- ☐ Key personnel and health and safety responsibilities
- ☐ Site hazards anticipated
- ☐ Exposure monitoring program
- ☐ Site control procedures
- ☐ PPE requirements
- ☐ Decontamination measures
- ☐ Location/route to the emergency hospital
- ☐ Training requirements
- ☐ Medical surveillance requirements
- ☐ Record keeping procedures
- ☐ Other specific site requirements.

6.2 Hazard Communication

☐ Site personnel will be informed of the hazardous substances that they will be working with through HSP review and attendance at daily safety meetings.

☐ The CSS "Hazard Communication Program" standard operating procedure will be referred to for additional guidance and requirements.

7.0 EMERGENCY RESPONSE PLAN

Emergency/contingency plans will be established to address possible site emergencies. For major emergency events (e.g., large fires, explosions, etc.), personnel will be evacuated to a designated refuge area and local fire, police, and/or emergency medical service personnel notified.

7.1 Site and Emergency Communications

Refer to attached emergency phone list.

7.2 Emergency Hospital and Route Information

Doctors Medical Center is the emergency hospital designated for this site. A description of the route to the hospital is provided in Attachment 1. The medical facility is capable of handling injured workers who may be contaminated by the chemical substances present at the site.

7.3 Response to Medical Emergency

In the event of a medical emergency, the following procedures will be implemented:

- ☐ The exposed or injured person will be removed from immediate danger, trained site personnel will administer first aid and/or CPR, and the victim will be decontaminated depending the nature and seriousness of the injury.

Phones are available that can be used to summon help in case of emergency. In case of cellular phone system wide failure, there are pay public phones at the facility.

- ☐ Emergency medical assistance will be called and will be informed of the following:
  - ☐ Name and location of person reporting
  - ☐ Location of accident or incident
  - ☐ Specific directions to the emergency location (as needed)
  - ☐ Phone number from which the person is calling
  - ☐ Number persons needing help
  - ☐ What is currently being done for victim(s)
  - ☐ For life-threatening injuries, request instructions from emergency services dispatcher for procedures to follow
  - ☐ Name and affiliation of injured party (is)
  - ☐ Description of injuries
  - ☐ Details of any chemical involved
  - ☐ Summary of the accident, including suspected causes and time of occurrence
  - ☐ Temporary control measures taken to minimize further risk.

7.4 Employee Medical Surveillance

Employee medical surveillance will be in compliance with all federal, state, and local regulations for all programs applicable to this project.

8.0 TRAINING

All personnel working on site must have completed hazardous waste operations (HazWoper) training as required by the OSHA "Hazardous Waste Operations and Emergency Response" standard (29 CFR 1910.120), and CCR 8 5192. Please note that employee training will be conducted in compliance with all federal, state, and local regulations for all programs applicable to this project. Required HazWoper training includes:

- ☐ Worker Training: 40-hours of initial training and 3 days of supervised field experience.
- ☐ Refresher Training: 8-hours of refresher training annually.

9.0 EMERGENCY TELEPHONE LIST

Paramedics/Ambulance (Emergency)	9-1-1
Fire Department (Emergency)	9-1-1
Police (Emergency)	9-1-1
Chemtrec (Chemical/Poison Information	(800) 424-9300
Underground Service Alert	(800) 227-2600
Emergency Spills (California EPA)	(415) 974-8131
OSHA	(800) 648-1003
Reaction Products Co. Offices (Richmond, CA)	(510) 234-5060
CSS Environmental Services, Inc. (San Rafael, CA)	(415) 457-9551
Aaron Stessman SSO (cellular)	(415) 948-4385
Terrance Carter Alternate SSO (cellular))	(415) 948-4514

HOSPITAL NAME/LOCATION

Doctor's Medical Center
2000 Vale Road
San Pablo, CA
(510) 235-7000

HOSPITAL ROUTE INFORMATION

See attached **Emergency Driving Directions** found in Appendix A

10.0 SITE SAFETY PLAN SIGNATURE FORM

Remedial Investigation at Reaction Products Site
Richmond, California

I have reviewed the Site Safety Plan for the Remedial Investigation at the Reaction Products Site and I understand the hazards presented on this project. I agree to follow the procedures outlined in this plan and to inform the CSS SSO should any unsafe conditions be noted. I understand that failure to follow safety requirements can be reason for removal from this project.

NAME	DATE	ORGANIZATION

Appendix A
Route to Hospital

MAPQUEST.

Send To Printer Back To Directions

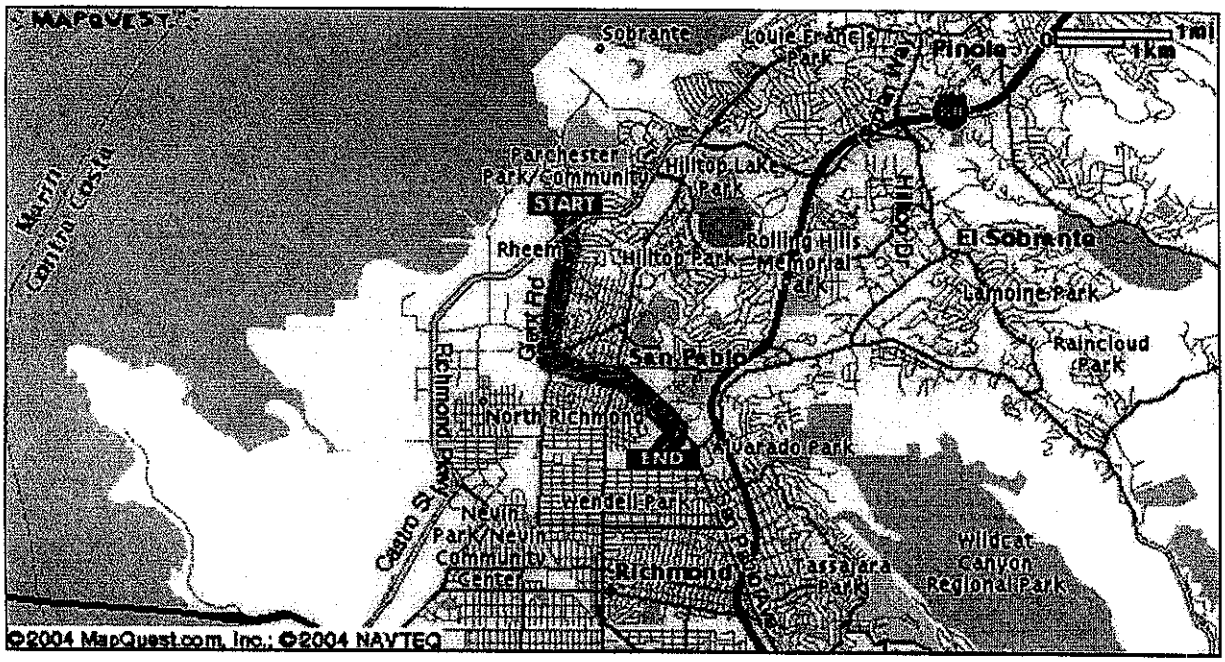
Start: 840 Morton Ave
Richmond, CA
94806-1756 US

End: **Doctor's Medical Ctr** 510-970-5000
2000 Vale Rd
San Pablo, CA
94806 US

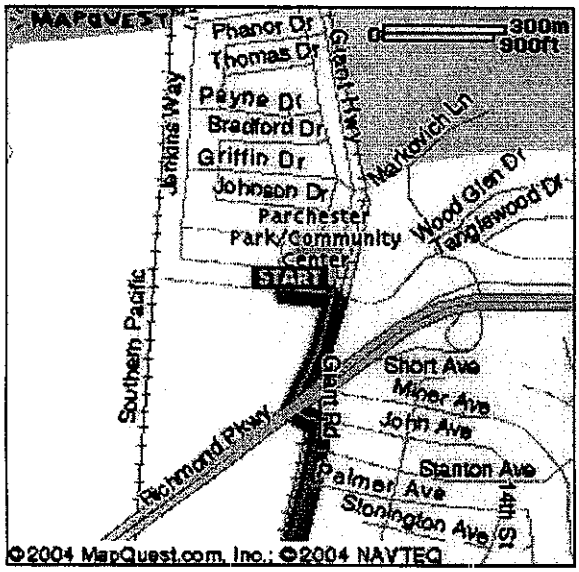
Distance: 3.01 miles

Total Estimated Time: 8 minutes

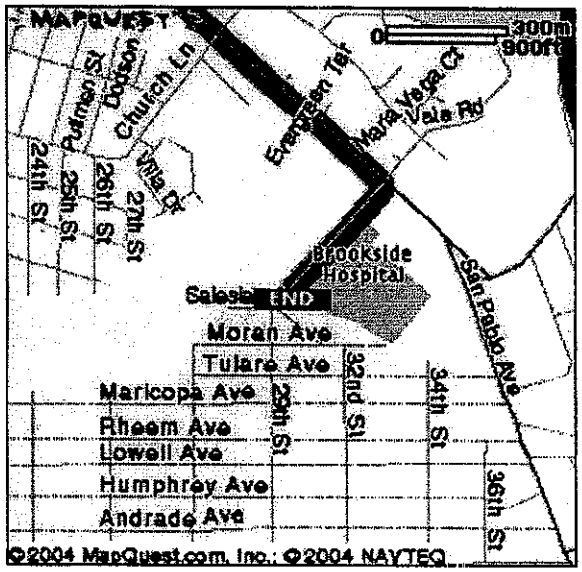
Directions	Distance
START **1.** Start out going East on MORTON AVE toward COLLINS AVE.	<0.1 miles
2. Turn RIGHT onto COLLINS AVE.	0.1 miles
3. Turn LEFT onto JOHN AVE.	<0.1 miles
4. Turn RIGHT onto GIANT RD.	1.0 miles
5. Turn LEFT onto BROOKSIDE DR.	0.6 miles
6. Turn SHARP LEFT onto 23RD ST.	<0.1 miles
7. Turn SLIGHT RIGHT onto SAN PABLO AVE	0.6 miles
8. Turn RIGHT onto VALE RD.	0.2 miles
END **End at Doctor's Medical Ctr 510-970-5000 2000 Vale Rd, San Pablo, CA 94806 US**	



Start:
840 Morton Ave
Richmond, CA
94806-1756 US



End:
Doctor's Medical Ctr 510-970-5000
2000 Vale Rd
San Pablo, CA
94806 US



NAVTEQ ON BOARD

Notes:

* ALTERNATE *

MAPQUEST.

Send To Printer Back To Directions

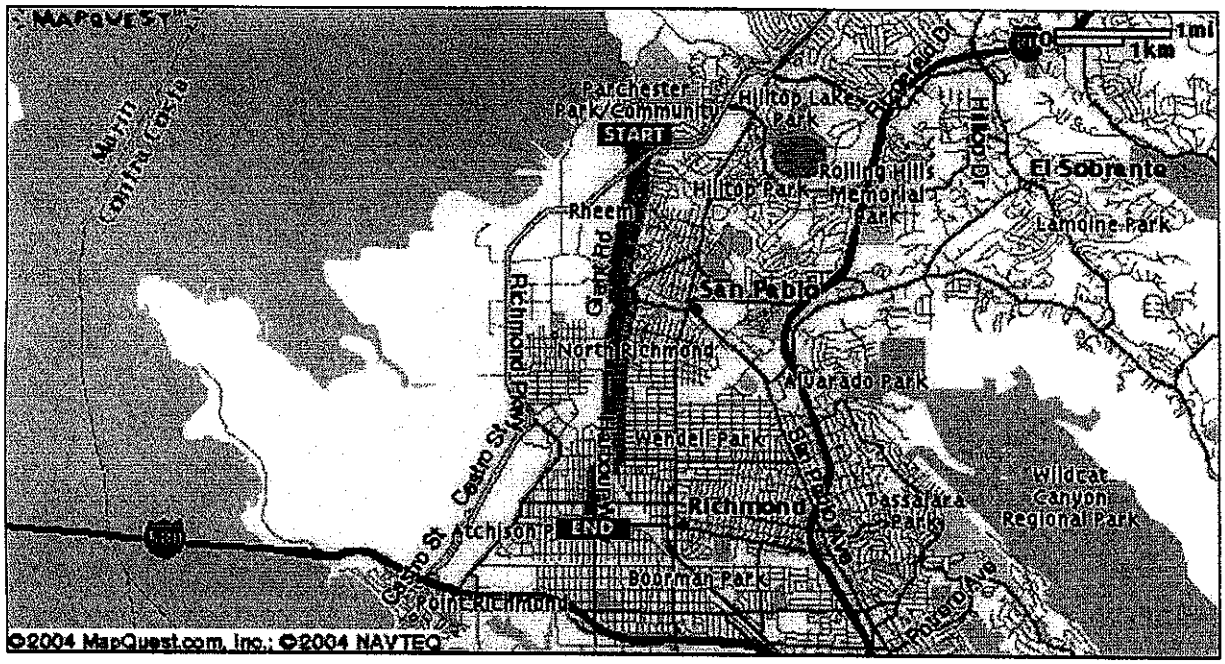
Start: 840 Morton Ave
Richmond, CA
94806-1756 US

End: **Kaiser Permanente Medical Ctr** 510-307-1500
901 Nevin Ave
Richmond, CA
94801 US

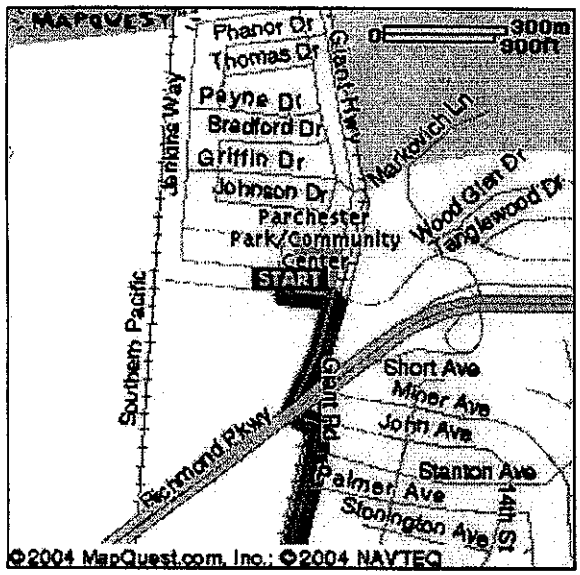
Distance: 3.47 miles

Total Estimated Time: 10 minutes

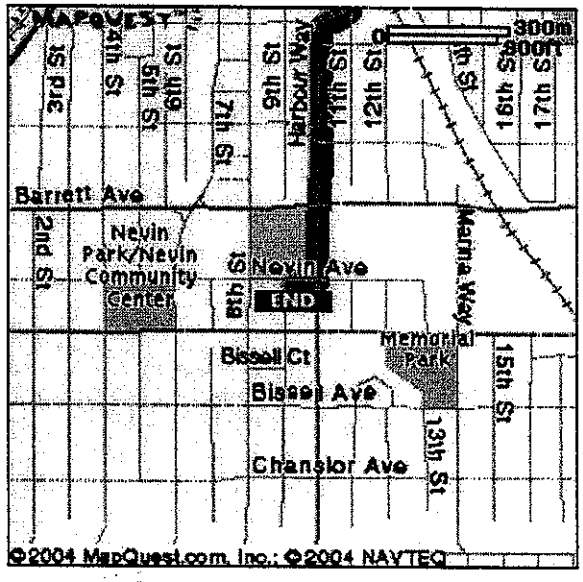
Directions	Distance
START **1.** Start out going East on MORTON AVE toward COLLINS AVE.	<0.1 miles
2. Turn RIGHT onto COLLINS AVE.	0.1 miles
3. Turn LEFT onto JOHN AVE.	<0.1 miles
4. Turn RIGHT onto GIANT RD.	1.0 miles
5. Turn LEFT onto BROOKSIDE DR.	0.1 miles
6. Turn RIGHT onto RUMRILL BLVD.	0.9 miles
7. RUMRILL BLVD becomes 13TH ST.	0.3 miles
8. Turn SLIGHT RIGHT onto PENNSYLVANIA AVE.	0.2 miles
9. Turn LEFT onto HARBOUR WAY.	0.3 miles
10. Turn RIGHT onto NEVIN AVE.	<0.1 miles
END **End at Kaiser Permanente Medical Ctr 510-307-1520 901 Nevin Ave, Richmond, CA 94801 US**	



Start:
840 Morton Ave
Richmond, CA
94806-1756 US



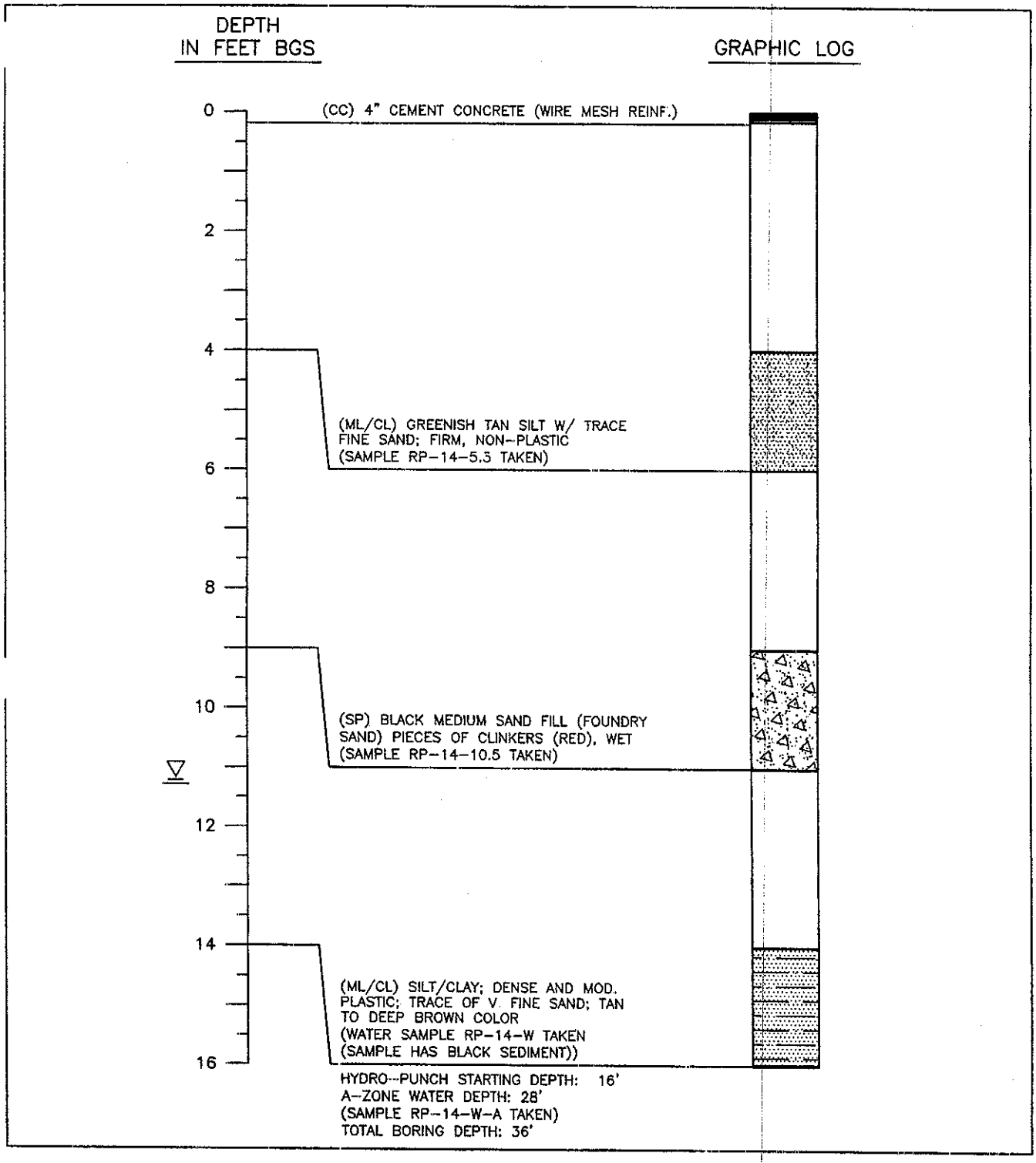
End:
Kaiser Permanente Medical Ctr 510-307-1520
901 Nevin Ave
Richmond, CA
94801 US



NAVTEQ ON BOARD

Notes:

APPENDIX B
BACKGROUND INFORMATION



BORING: RP-14

DRILL DATE: 05/28/02

DRILLER: FISCH EES

DRILLING METHOD: GEOPROBE - 5400

LOGGED BY: AARON STESSMAN, PE

PROJECT MGR: AARON STESSMAN, PE

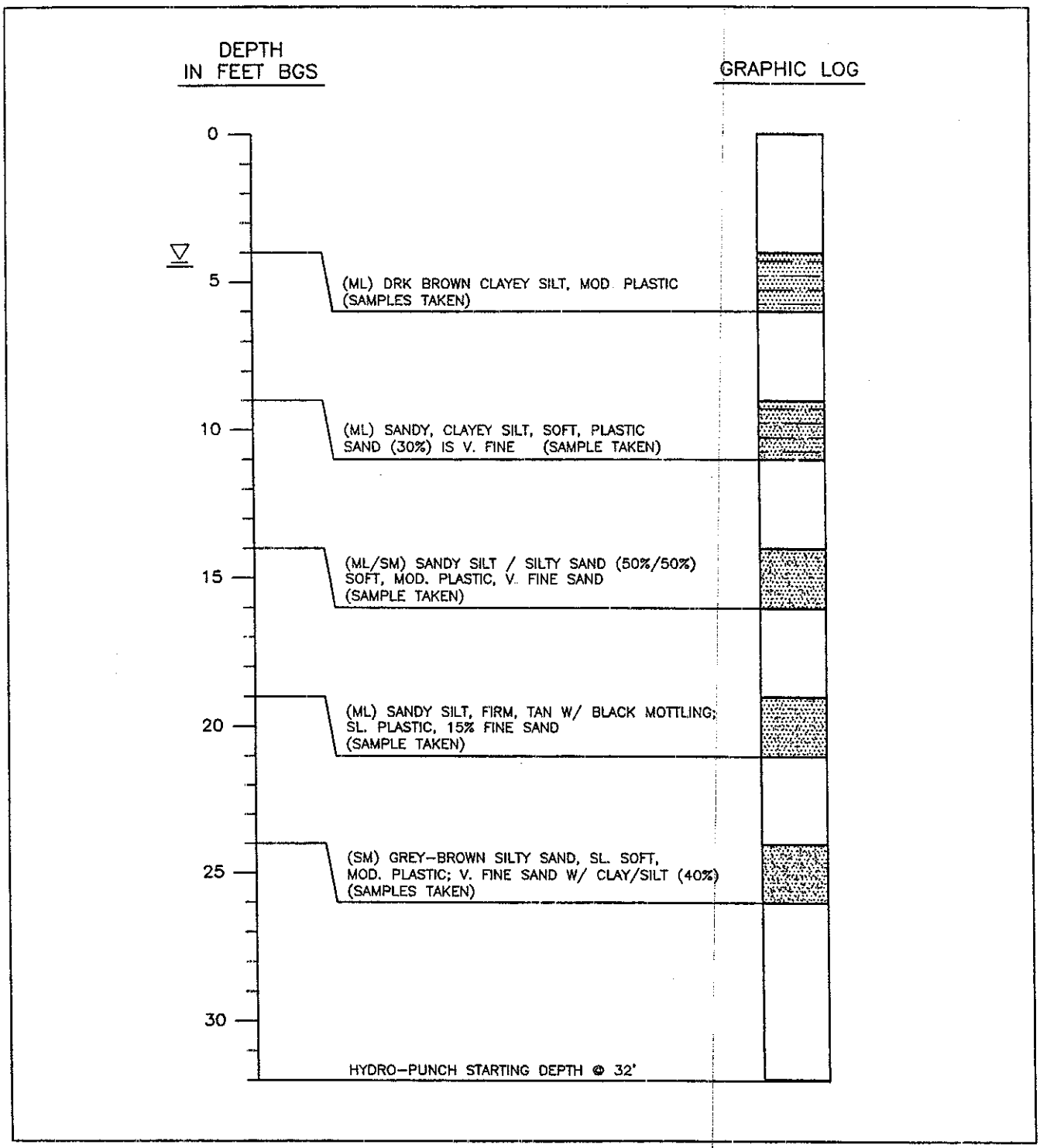
CSS ENVIRONMENTAL SERVICES, INC

RP-14 BORING LOG

REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

FIGURE 8

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	06/02	BORLOG	BED	00/00



BORING: RP--15

DRILL DATE: 01/02/02

DRILLER: FISCH EES

DRILLING METHOD: GEOPROBE - 6600

LOGGED BY: AARON STESSMAN, PE

PROJECT MGR: AARON STESSMAN, PE

CSS ENVIRONMENTAL SERVICES, INC.

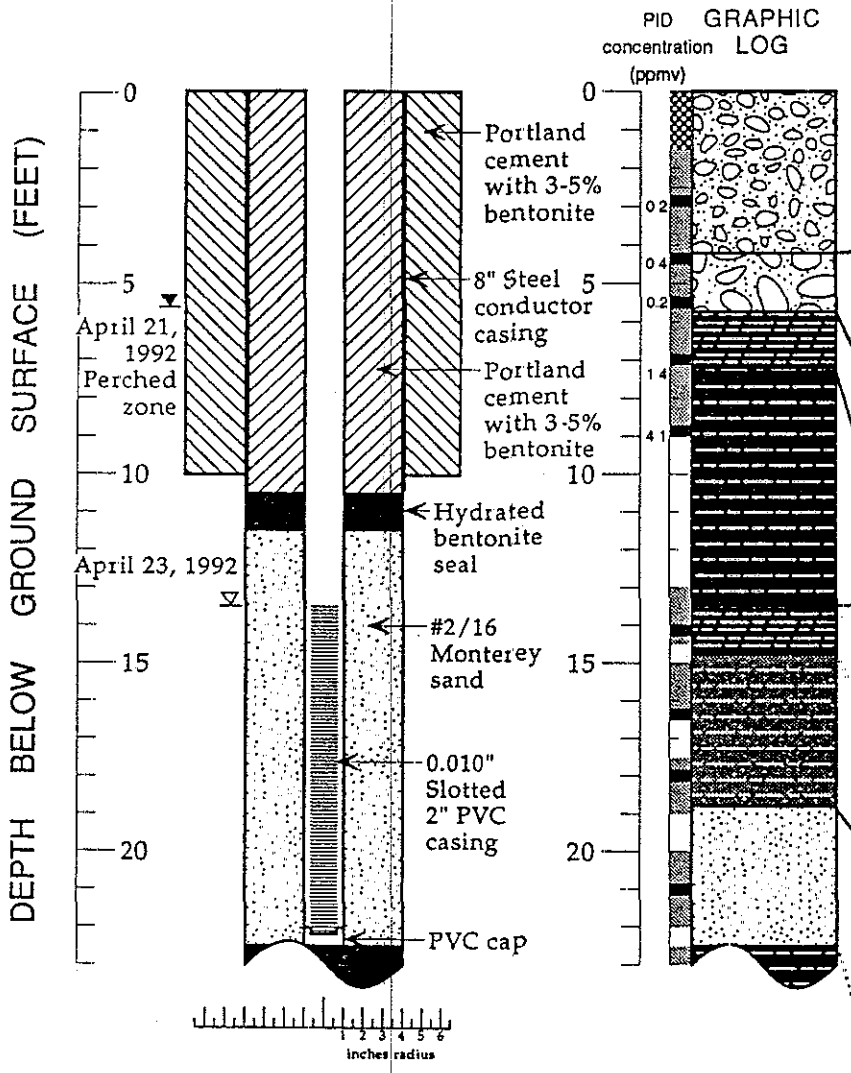
RP-15 BORING LOG

REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

FIGURE 9

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	01/02	BORLOG	BED	00/00

WELL RP-2



DESCRIPTION

Gravelly SAND (SW); black; very loose; dry to damp; <5% silt; 55-60% very fine to very coarse sand; 40% gravel to 1" diameter; high K; steel slag pieces; [fill]

Sandy GRAVEL (GW); dark gray; very loose; moist to wet; 40% very fine to very coarse sand; 60% gravel to 3" diameter; high K; slag and wood pieces; [fill]

Clayey SILT (ML); dark gray; medium stiff; moist; 20% clay;70% silt; 10% very fine to fine sand; low to moderate plasticity; low K

Silty CLAY (CH); dark gray; stiff; damp; 70% clay; 30% silt; high plasticity; very low K

Clayey SILT (ML); gray mottled light brown; very stiff; 25% clay; 60% silt; 15% very fine to medium sand; low plasticity; low K; rootholes

Sandy SILT (ML); light brown; stiff; moist; 5-10% clay; 75-80% silt; 15% very fine to coarse sand; low to moderate K

SAND (SW); brown; loose; wet; 5% silt; 90% very fine to very coarse sand; 5% gravel to 0.25" diameter; high K

Sandy SILT layer 20.8'-20.9'

Silty SAND layer 21.6'-21.9'

Silty CLAY (CH); yellow-brown; very stiff; moist; 70% clay; 30% silt; high plasticity; very low K; rootholes

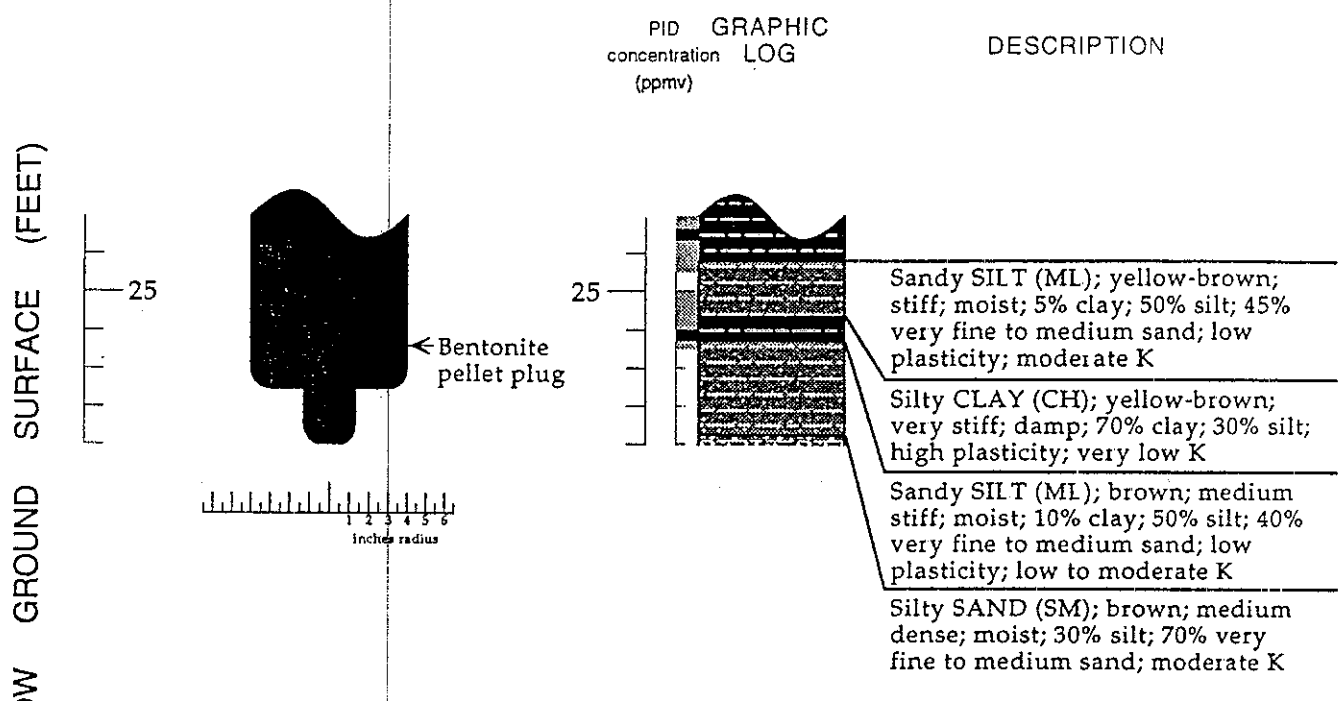
EXPLANATION

- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approximate)
- —?—?— Uncertain contact
- Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Tom Fojut
Supervisor: Robert O. Devany; CEG 1560
Drilling Company: Weeks Drilling & Pump Co., Sebastapol, CA
License Number: C57-177681
Driller: Gary Meyers
Drilling Method: Hollow-stem auger
Date Drilled: April 21-23, 1992
Well Head Completion: 2" locking well-plug, above grade steel cylinder
Type of Sampler: Continuous core (2.5" ID), split barrel (2.5' ID)
Top of Casing Elevation: 18.5 feet above mean sea level
PID: Soil headspace VOC concentration by field photoionization detector

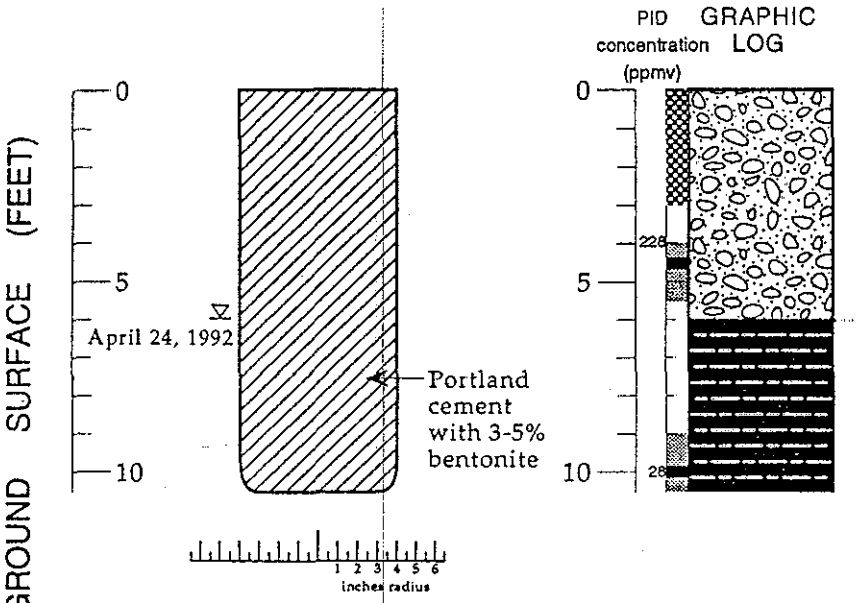
Lithology Log and Well Construction Details - Well RP-2 - Reaction Products, 840 Morton Avenue, Richmond, California

WELL RP-2



Lithology Log and Well Construction Details - Well RP-2 - Reaction Products, 840 Morton Avenue, Richmond, California

BOREHOLE RP-4



Gravelly SAND (SW); black; loose; moist to wet; 5% silt; 70% very fine to very coarse sand; 25% gravel to 2" diameter; high K; odor; rock, steel slag, and debris; [fill]

(contact-driller)

Silty CLAY (CH); black; stiff; moist; 70% clay; 30% silt; high plasticity; very low K

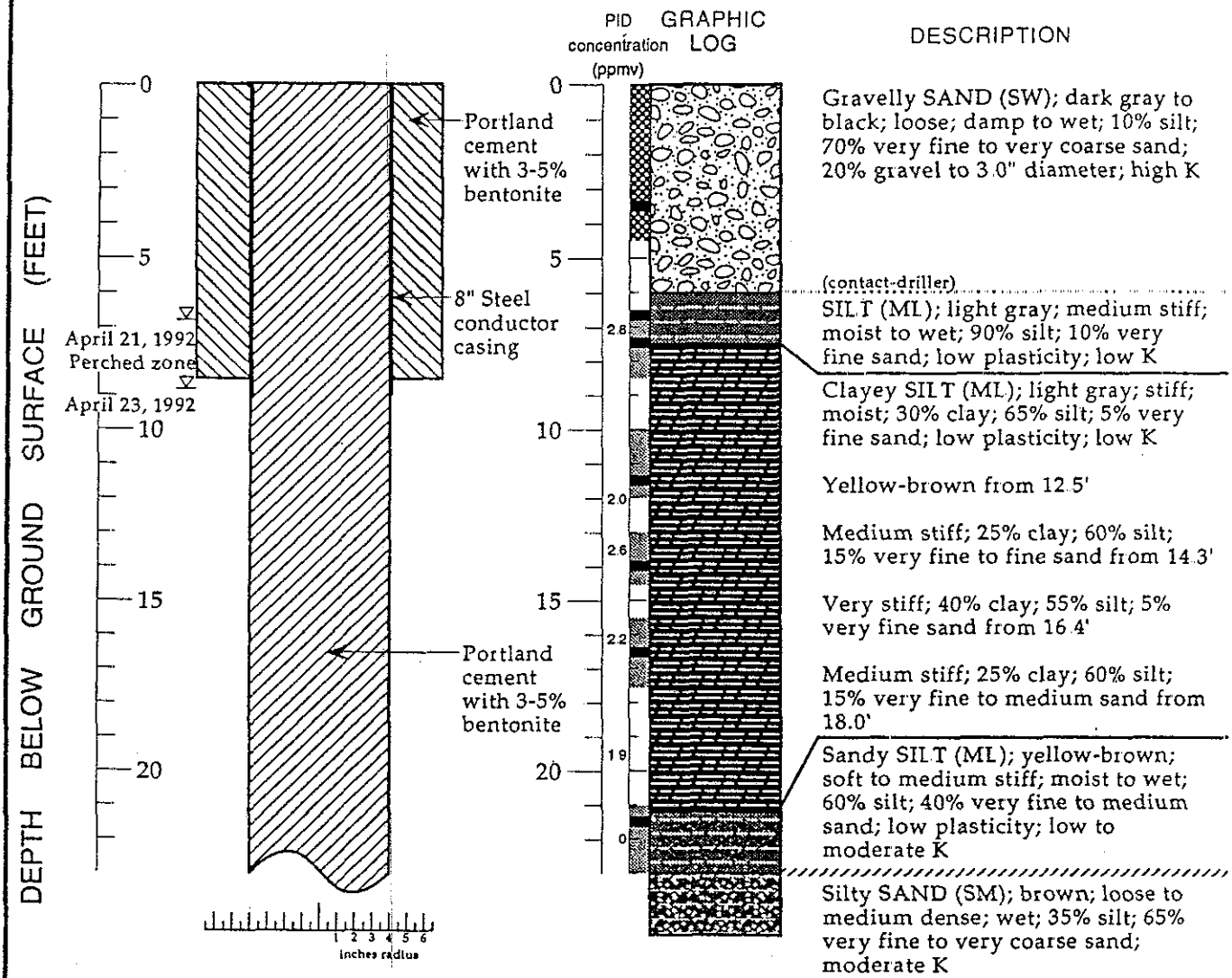
EXPLANATION

- ⧗ Water level during drilling (date)
- ⧖ Water level (date)
- ——— Contact (dotted where approximate)
- —?—?— Uncertain contact
- //////// Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Tom Fojut
Supervisor: Robert O. Devany; CEG 1560
Drilling Company: Weeks Drilling & Pump Co., Sebastapol, CA
License Number: C57-177681
Driller: Gary Meyers
Drilling Method: Hollow-stem auger
Date Drilled: April 24, 1992
Type of Sampler: Split barrel (2.5" ID)
PID: Soil headspace VOC concentration by field photoionization detector

Lithology Log and Closure - Borehole RP-4 - Reaction Products, 840 Morton Avenue, Richmond, California

BOREHOLE RP-5



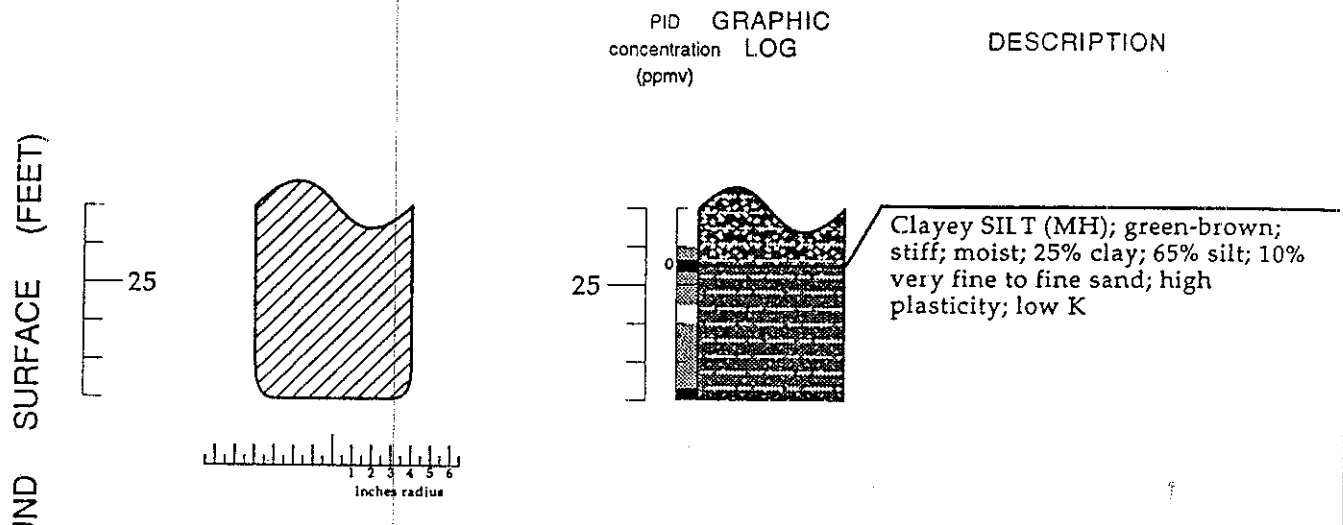
EXPLANATION

- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approximate)
- Uncertain contact
- Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Tom Fojut
Supervisor: Robert O. Devany; CEG 1560
Drilling Company: Weeks Drilling & Pump Co., Sebastapol, CA
License Number: C57-177681
Driller: Gary Meyers
Drilling Method: Hollow-stem auger
Date Drilled: April 21-23, 1992
Type of Sampler: Split barrel (2.5" ID)
PID: Soil headspace VOC concentration by field photoionization detector

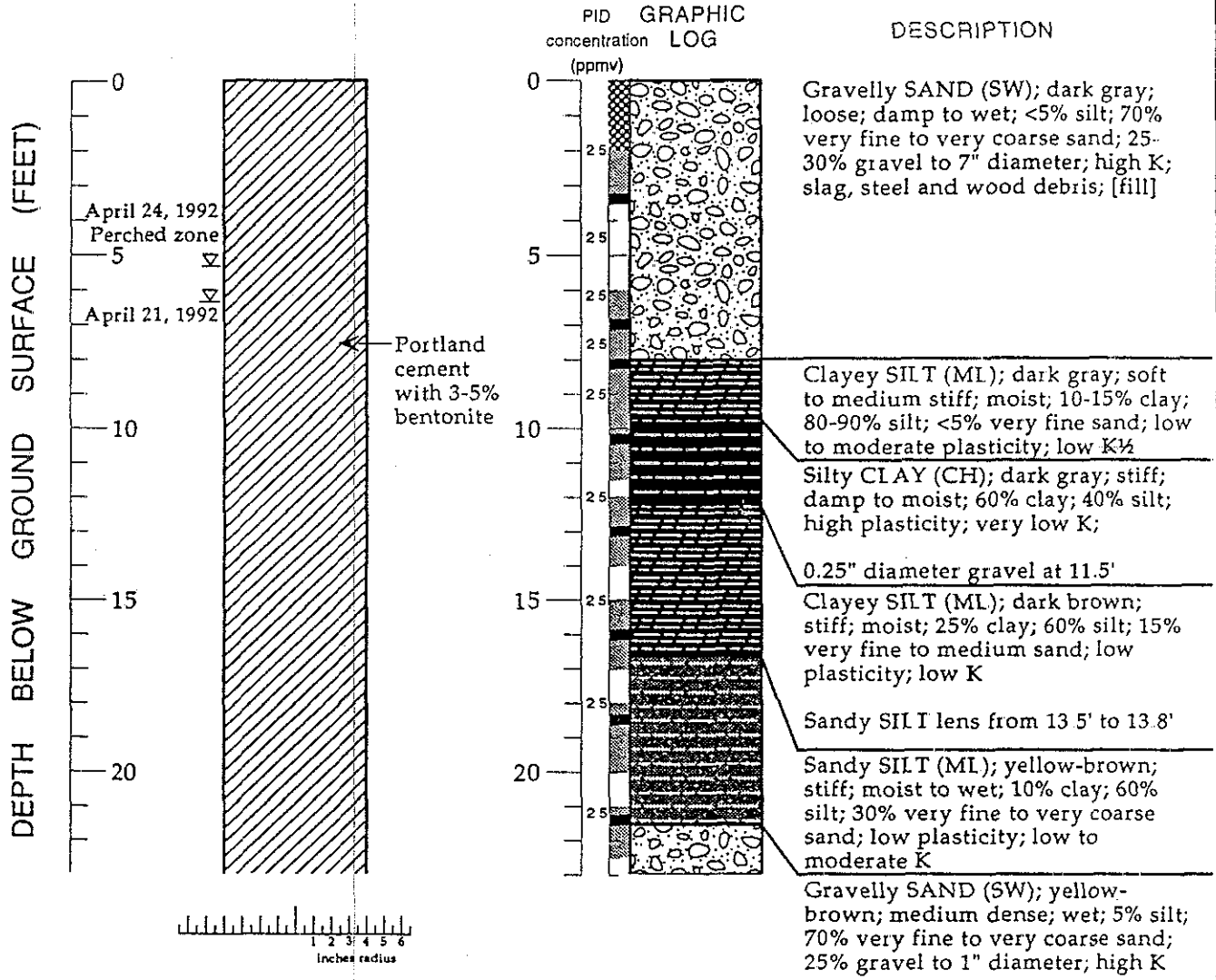
Lithology Log and Closure Details - Borehole RP-5 - Reaction Products, 840 Morton Avenue, Richmond, California

BOREHOLE RP-5



Lithology Log and Closure Details - Borehole RP-5 - Reaction Products, 840 Morton Avenue, Richmond, California

BOREHOLE RP-6



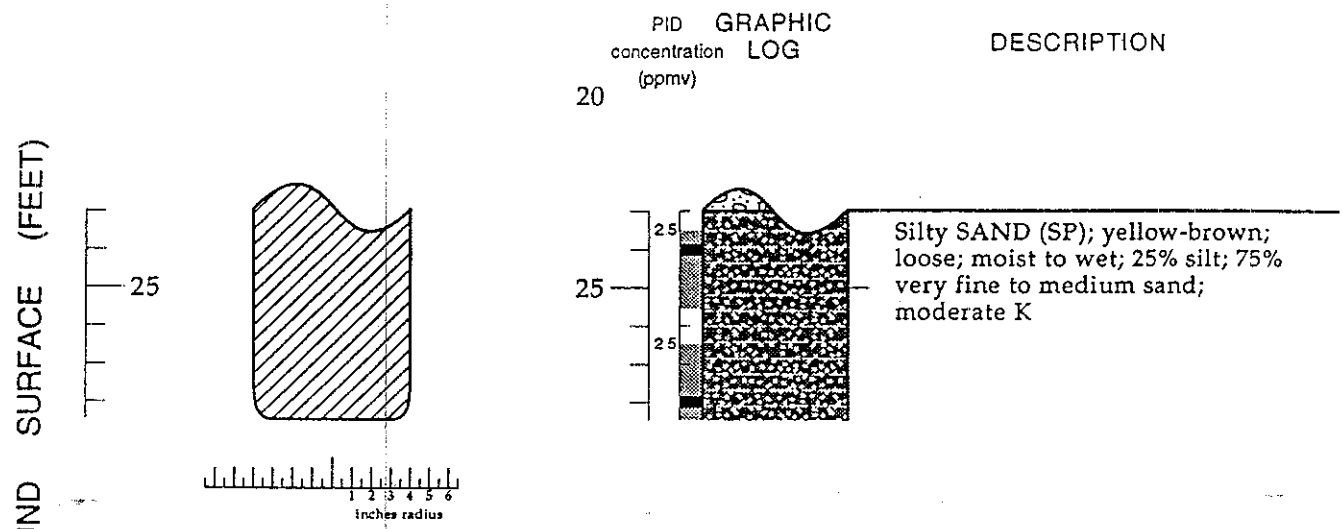
EXPLANATION

- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approximate)
- —?—?— Uncertain contact
- Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Tom Fojut
Supervisor: Robert O. Devany; CEG 1560
Drilling Company: Weeks Drilling & Pump Co., Sebastapol, CA
License Number: C57-177681
Driller: Gary Meyers
Drilling Method: Hollow-stem auger
Date Drilled: April 21-24, 1992
Type of Sampler: Split barrel (2.5" ID)
PID: Soil headspace VOC concentrations by field photoionization detector

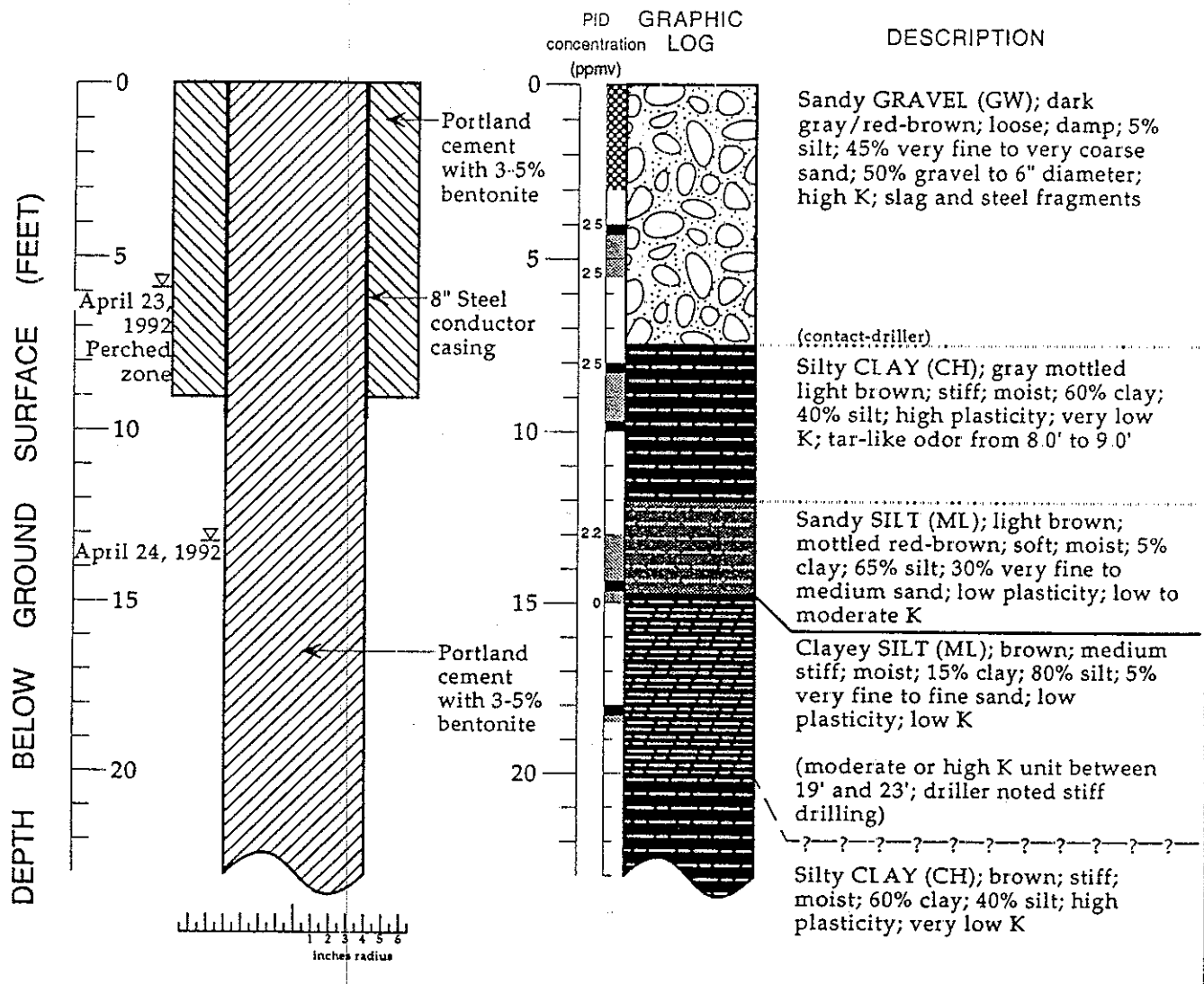
Lithology Log and Closure Details - Boring RP-6 - Reaction Products, 840 Morton Avenue, Richmond, California

BOREHOLE RP-6 (cont.)



Lithology Log and Closure Details - Boring RP-6 - Reaction Products, 840 Morton Avenue, Richmond, California

BOREHOLE RP-7



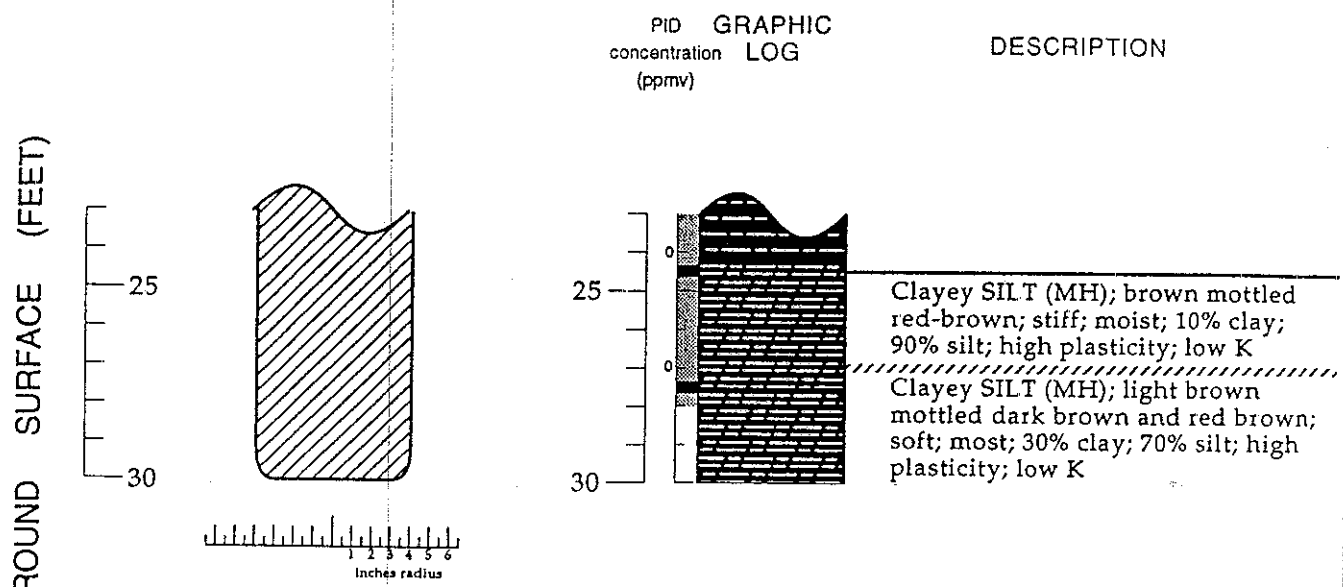
EXPLANATION

- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approximate)
- Uncertain contact
- Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Tom Fojut
Supervisor: Robert O. Devany; CEG 1560
Drilling Company: Weeks Drilling & Pump Co., Sebastapol, CA
License Number: C57-177681
Driller: Gary Meyers
Drilling Method: Hollow-stem auger
Date Drilled: April 23-24, 1992
Type of Sampler: Split barrel (2.5" ID)
PID: Soil headspace VOC concentration by field photoionization detector

Lithology Log and Closure Details - Borehole RP-7 - Reaction Products, 840 Morton Avenue, Richmond, California

BOREHOLE RP-7

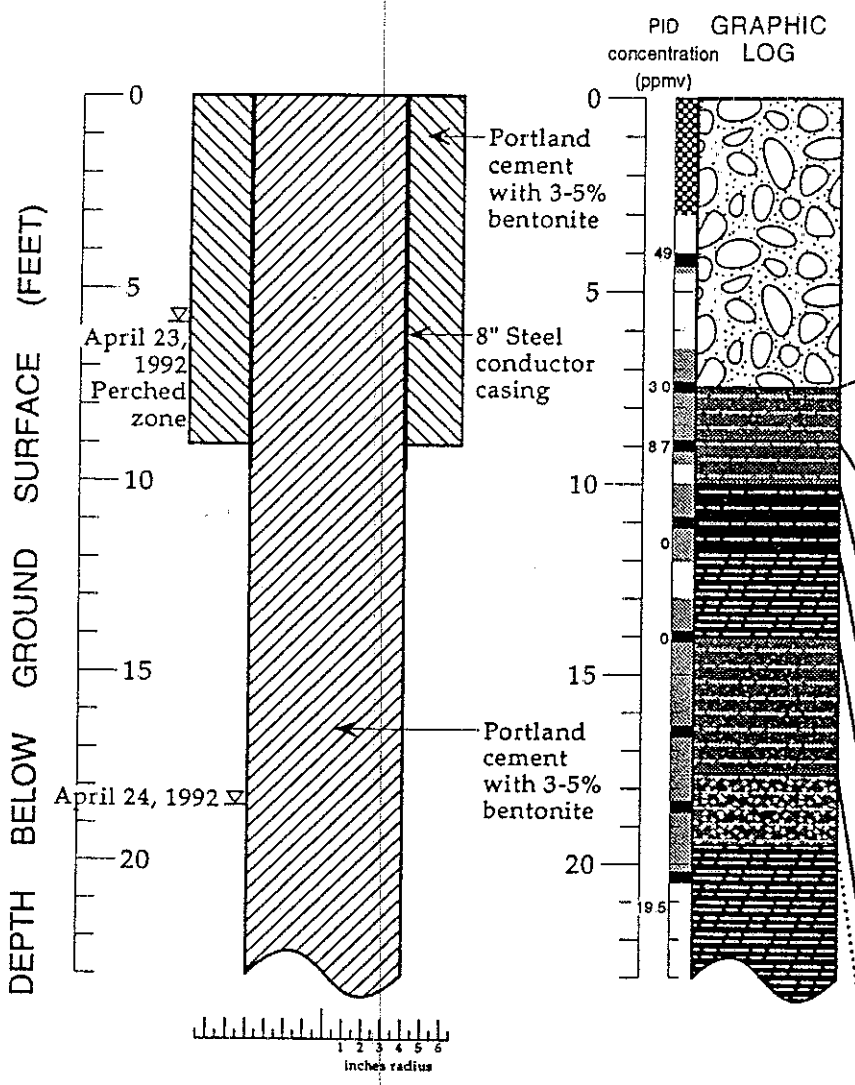


Lithology Log and Closure Details - Borehole RP-7 - Reaction Products, 840 Morton Avenue, Richmond, California

reac-007 ai

2/22/93

BOREHOLE RP-8



DESCRIPTION

Sandy GRAVEL (GW); dark gray; loose; damp; 40% very fine to very coarse sand; 60% gravel to 5" diameter; high K; [fill]

Wood fragments from 6 5 to 7 25'
Petroleum odor and sheen on sample from 6 5 to 8'
[Odor and sheen in water-not soil]

Sandy SILT (ML); black; soft; moist to wet; 10% clay; 70% silt; 20% very fine to medium sand; low to medium plasticity; low to moderate K

SILT (ML); black; soft; moist to wet; 5% clay; 90% silt; 5% very fine to medium sand; low to medium plasticity; low to moderate K; tar-like odor from 8.0-9.5'

Silty CLAY (CH); dark gray; stiff; moist; 40% clay; 35% silt; 25% very fine to medium sand; moderate to high plasticity; very low K

Clayey SILT (ML); dark brown; stiff; most; 25% clay; 60% silt; 15% very fine to medium sand; low plasticity; low K

Sandy SILT (ML); brown; medium stiff; 5% clay; 70% silt; 25% very fine to coarse sand; low plasticity; low to moderate K
15% clay; 65% silt; 20% very fine to coarse sand from 15.0'

Silty SAND (SM); blue-brown; loose; wet; 30% silt; 70% very fine to very coarse sand; moderate K

Clayey SILT (MH); brown; medium stiff; moist; 20% clay; 65% silt; 15% very fine to medium sand; high plasticity; low K

EXPLANATION

- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approximate)
- Uncertain contact
- Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Tom Fojut
Supervisor: Robert O. Devany; CEG 1560
Drilling Company: Weeks Drilling & Pump Co , Sebastapol, CA
License Number: C57-177681
Driller: Gary Meyers
Drilling Method: Hollow-stem auger
Date Drilled: April 23-24, 1992
Type of Sampler: Split barrel (2.5" ID)
PID: Soil headspace VOC concentration by field photoionization detector

Lithology and Closure Details - Borehole RP-8 - Reaction Products, 840 Morton Avenue, Richmond, California

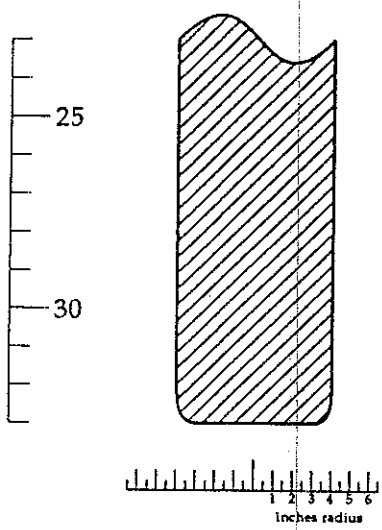
BOREHOLE RP-8

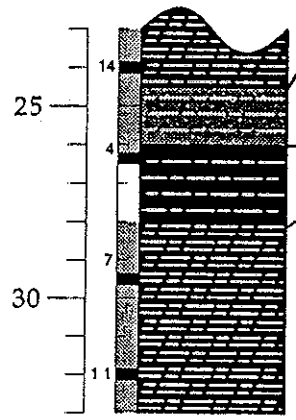
PID concentration (ppmv)

GRAPHIC LOG

DESCRIPTION

DEPTH BELOW GROUND SURFACE (FEET)



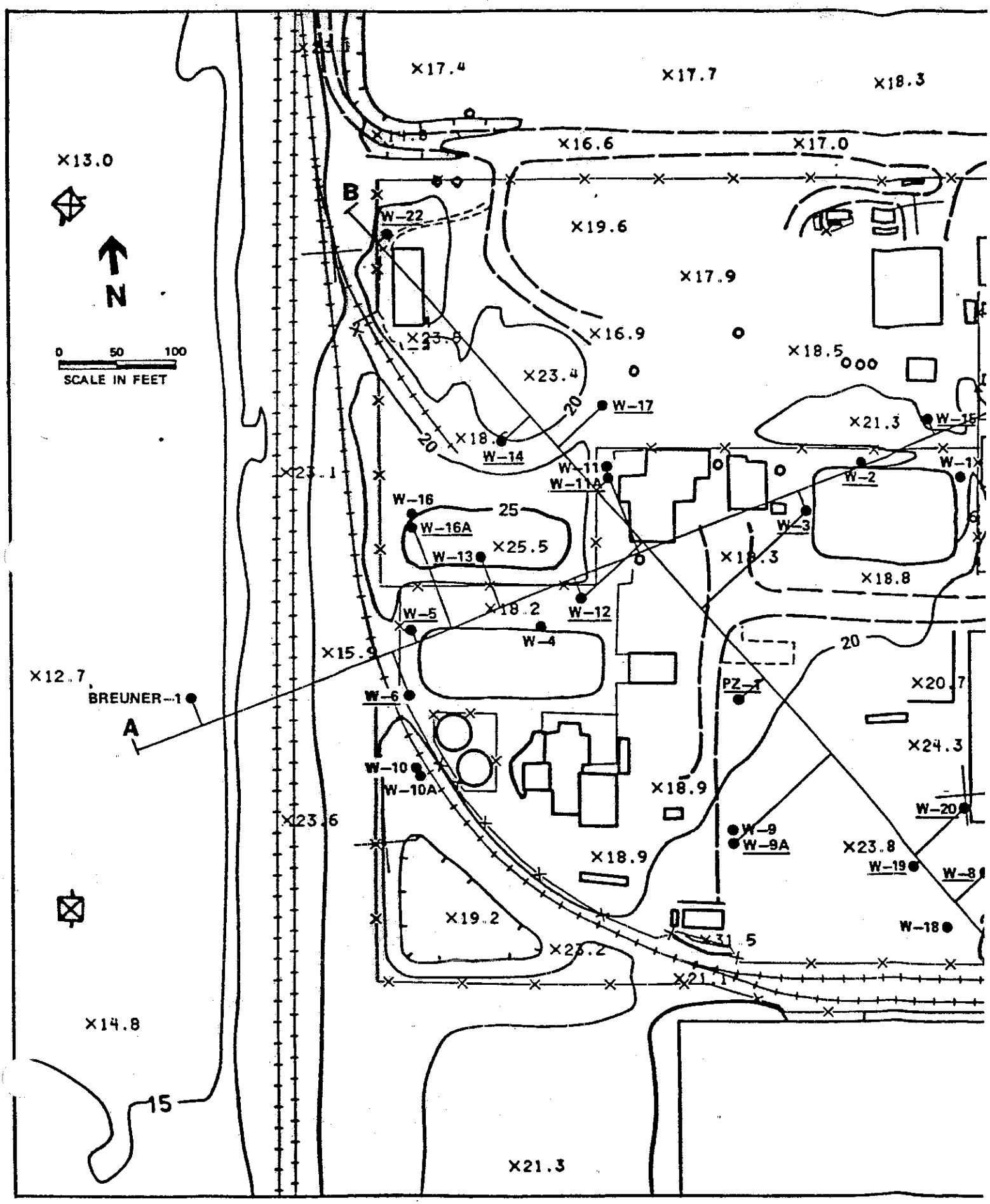


Sandy SILT (ML); blue-brown and red-brown; firm; most; 5% clay; 80% silt; 15% very fine to fine sand; low plasticity; low to moderate K

Silty CLAY (CH); red-brown; very stiff; moist; 70% clay; 30% silt; high plasticity; very low K

Clayey SILT (MH); light brown mottled dark brown and red brown; soft; most; 30% clay; 70% silt; high plasticity; low K

Lithology and Closure Details - Borehole RP-8 - Reaction Products, 840 Morton Avenue, Richmond, California


N
0 50 100
SCALE IN FEET
A
B
BREUNER-1
W-22
W-17
W-14
W-11
W-11A
W-16
W-16A
W-13
W-5
W-4
W-12
W-6
W-10
W-10A
W-2
W-3
PZ-1
W-9
W-9A
W-20
W-19
W-8
W-18
×13.0
×17.4
×17.7
×18.3
×16.6
×17.0
×19.6
×17.9
×16.9
×18.5
×23.4
×21.3
×18.6
×23.1
25
×25.5
×18.3
×18.8
×18.2
×15.9
×12.7
×20.7
×24.3
×18.9
×23.6
×23.8
×19.2
×31.5
×23.2
×21.1
×14.8
15
×21.3
20

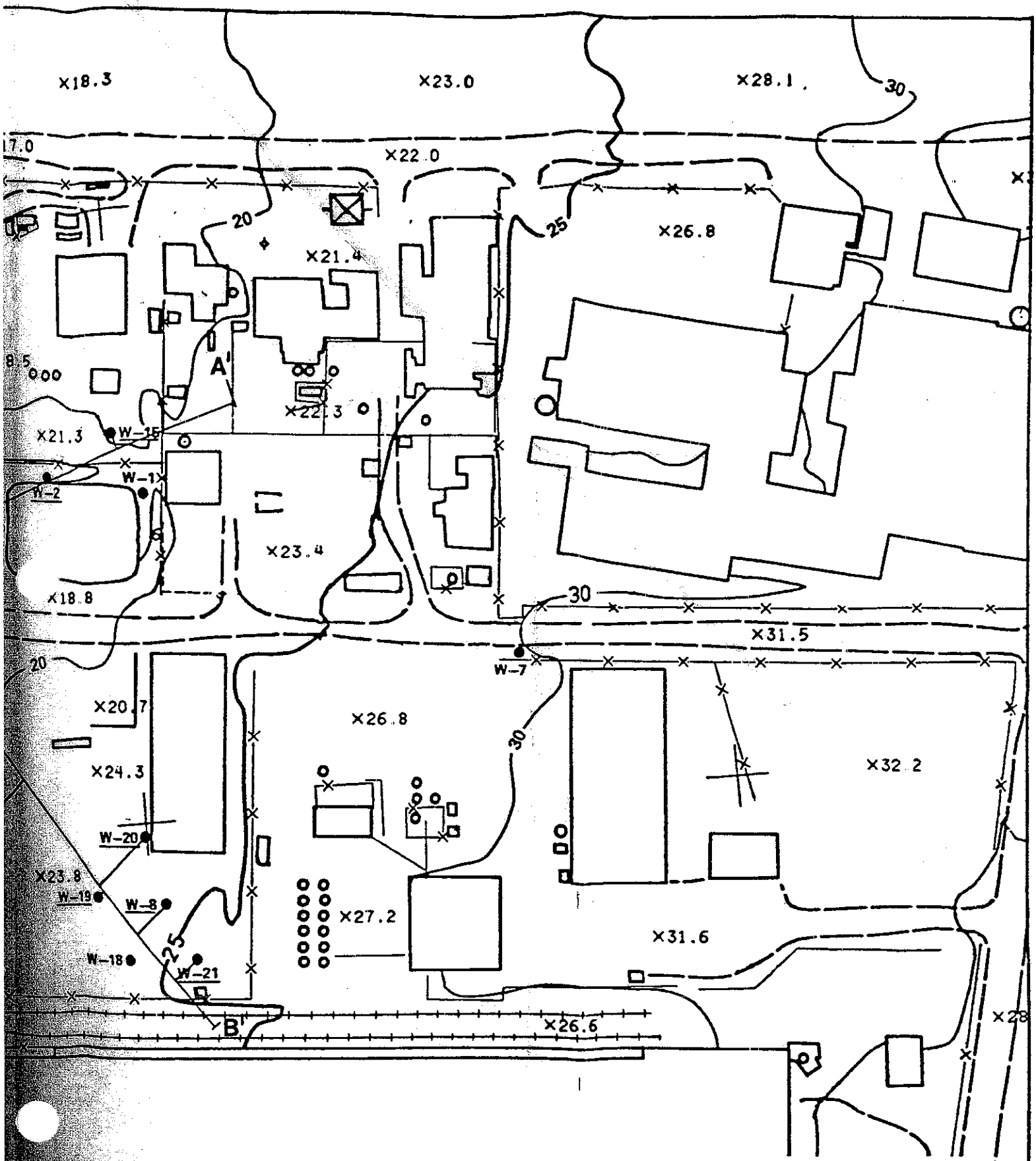


Figure 9-4
Location of Cross Sections and Fence Diagram

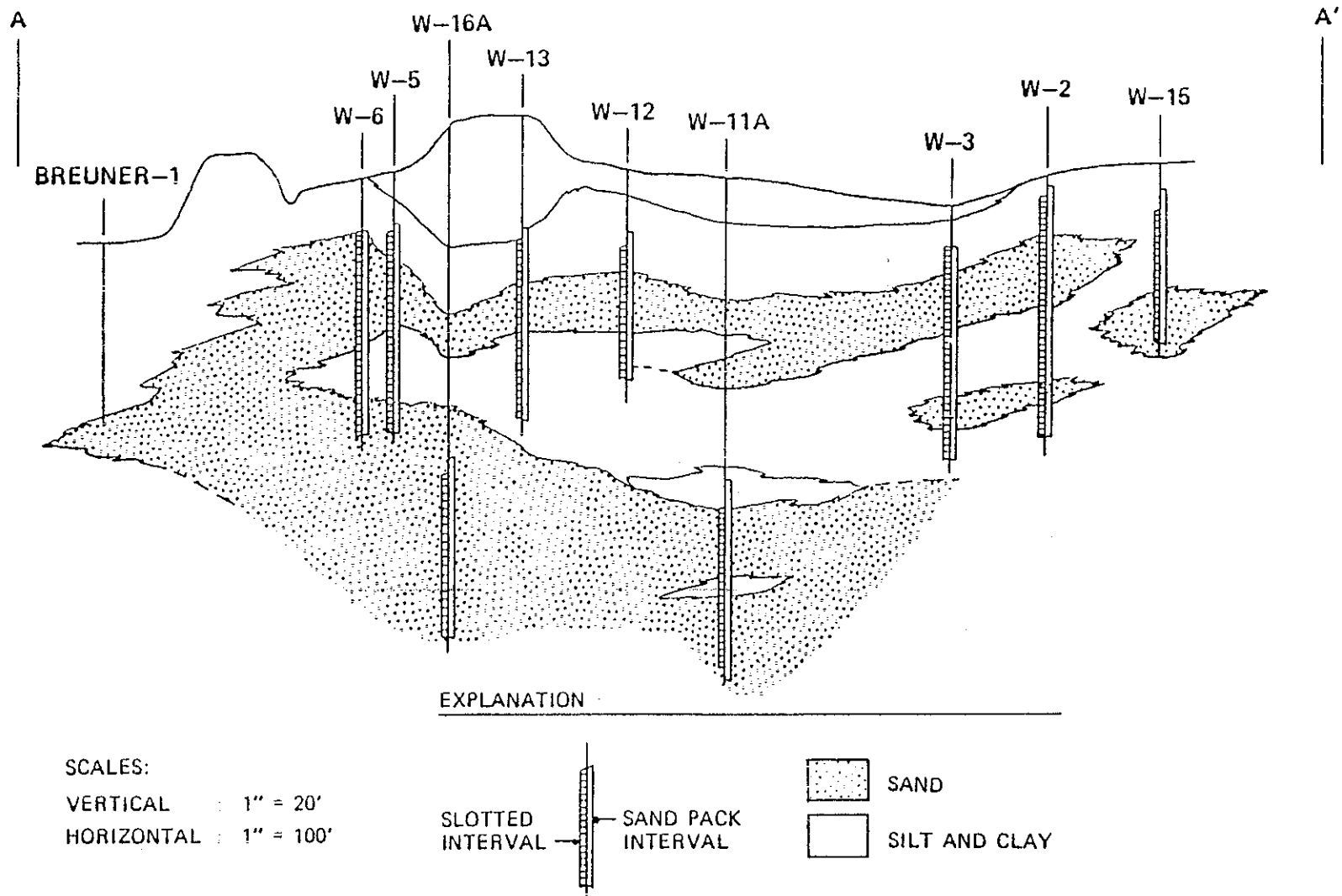


Figure 9-5 Cross Section A-A'

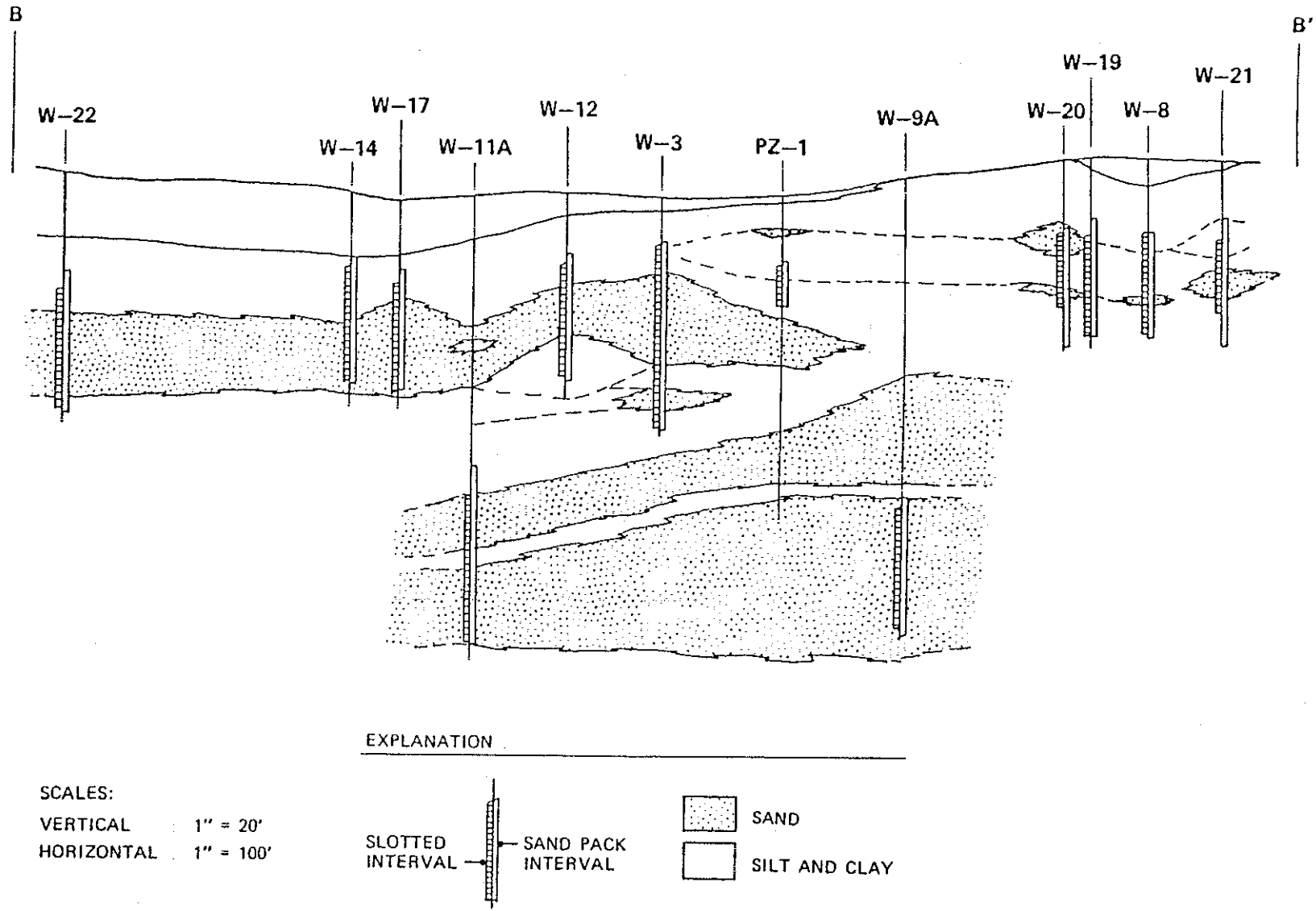


Figure 9-6 Cross Section B-B'

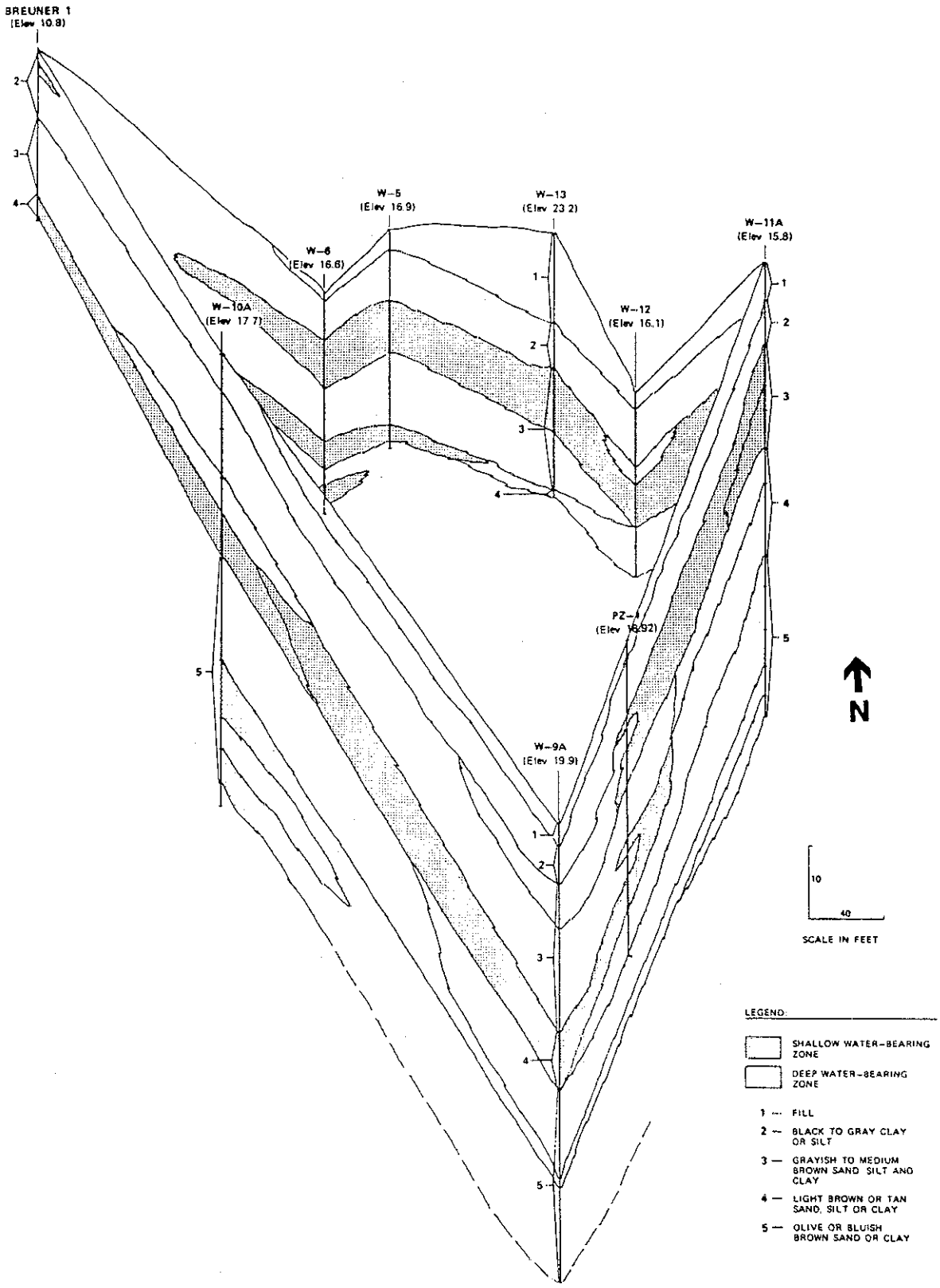


Figure 9-7 Fence Diagram

CLIENT: WITCO CHEMICAL CO.

JOB NUMBER: 1986-12

MONITORING WELL: W-22

TOP OF CASING EL. 21.47

GROUND SURFACE EL. 19.7

BOREHOLE DEPTH 34.0 FT.

BOREHOLE DIAMETER 10 IN.

WELL DEPTH 32.5 FT.

DRILLER KLEINFELDER

DRILLING RIG CME 750

BIT(S) HOLLOW STEM AUGER

BC GEOLOGIST SLAVIN

WELL DESIGN	INTERVAL	LEGEND
BLANK CASING TYPE: 4"PVC SCH 40	0 - 15.0	
SLOTTED CASING TYPE: 2"PVC SCH 40 SLOT: 0.02"	15.0 - 32.5	
CONCRETE TYPE: READY MIX	0 - 11.8	
BENTONITE TYPE: 3/8" PELLETS	11.8 - 13.0	
SAND SIZE: #2	13.0 - 34.0	
FIRST WATER		✳✳
STATIC WATER LEVEL		▼

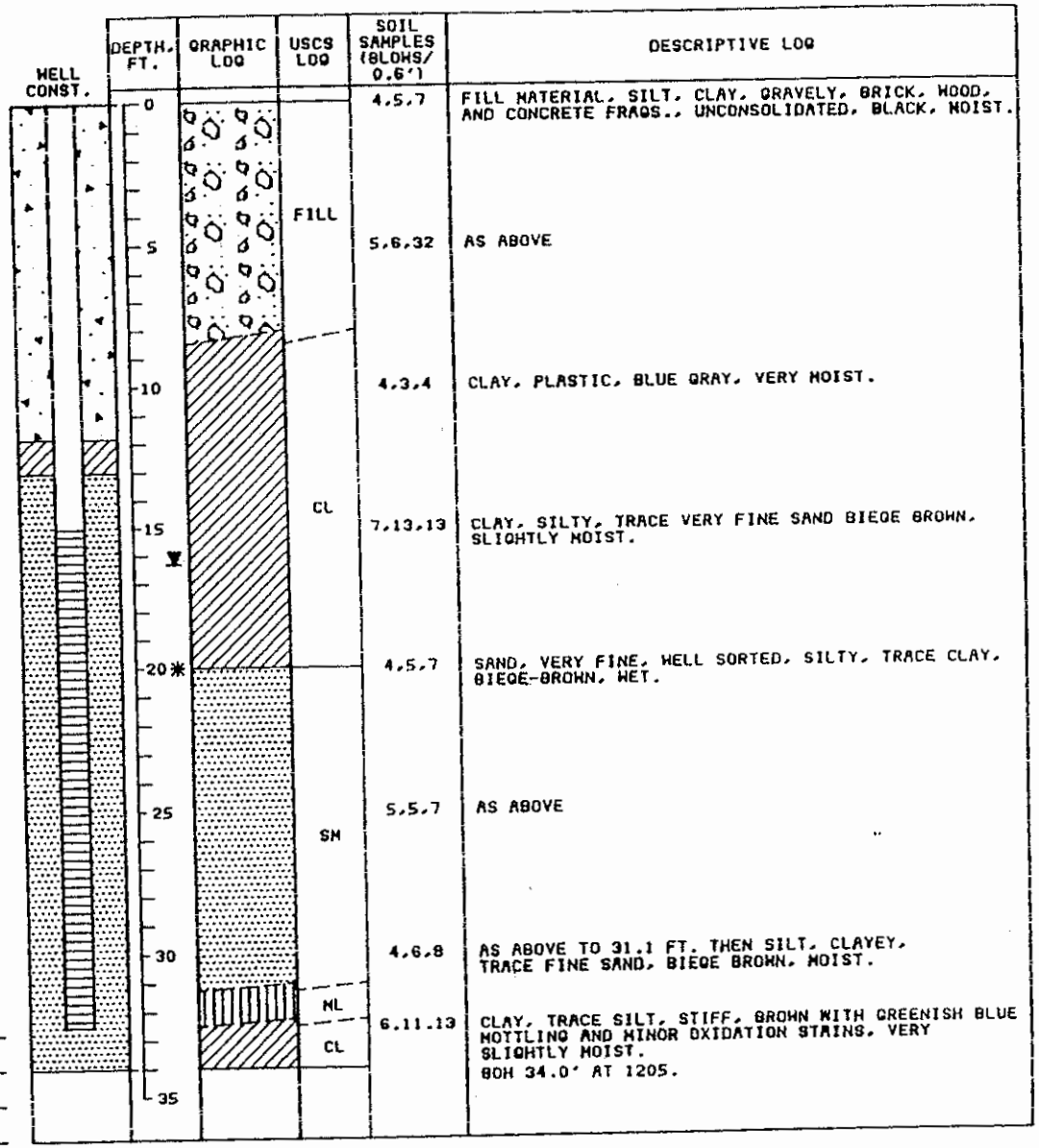
DEVELOPMENT METHOD SURGE BLOCK/OVER PUMPING

CASING AND BORING VOLUME ~17 GALS

VOLUME OF WATER REMOVED 170

TIME LOG

	START DATE	START TIME	FINISH DATE	FINISH TIME
DRILLING	1-16-86	0745	1-18-88	1205
WELL CONSTRUCTION	1-16-86	1210	1-16-86	1420
DEVELOPMENT	1-24-88	1000	1-24-88	1345
SAMPLING	2-20-86	1025	2-20-86	1130



BROWN AND CALDWELL

LOG OF SOIL BORING OR MONITOR WELL (CONTINUED)

BORING / WELL: W-14	PROJECT: Witco Chemical	SHEET: 2 / 2

DEPTH, FT.	SAMPLE	BLOWS PER 6 INCHES	WELL DESIGN	USC SOIL TYPE	DESCRIPTION OF SUBSURFACE MATERIALS
		7			Medium brown with dark brown and black spots (3mm) and oxidation stains. Sandy clay with coarse gravel (poorly sorted, well rounded, 5mm).
		13			
		6			
20		6			Medium light brown with black spots and oxidation staining. Sugary texture homogeneous clayey, fine sand.
		6			
		9		SC	
25		5			
		7			Same as above, but clayier. SOH - 26.5
		9			

Hold 24.0 Cut 1.9 Dtw-22.1

BORING WELL NO. W-14

A

BC BROWN AND CALDWELL

LOG OF SOIL BORING OR MONITOR WELL

BORING / WELL: M-14	PROJECT: Witco Chemical JOB NO.: 1986-04	SHEET: 1 /2

___ BACKFILLED SOIL BORING _X_ MONITOR WELL ___ MULTI-CASED WELL

DRILL CONTRACTOR: Kleinfelder
DRILL RIG: CME 550
BC PERSONNEL: Slavin/Gregory

HOLE DIAMETER: 6¼"
SAMPLE TYPE: Standard Penetration
DRIVE ENERGY: Freefall, 140 lbs hammer

	TIME	DATE
START:	0840	10/01/84
FINISH:	0930	10/01/84
BACKFILL:		
FINISH WELL:	1040	10/01/84

ELEVATIONS
DATUM: USCGS Mean Sea Level
GROUND SURFACE: 16.7
TOP WELL CASING: 19.11

SUBSURFACE FLUIDS / GROUNDWATER

DEPTH FROM GROUND	TIME	DATE

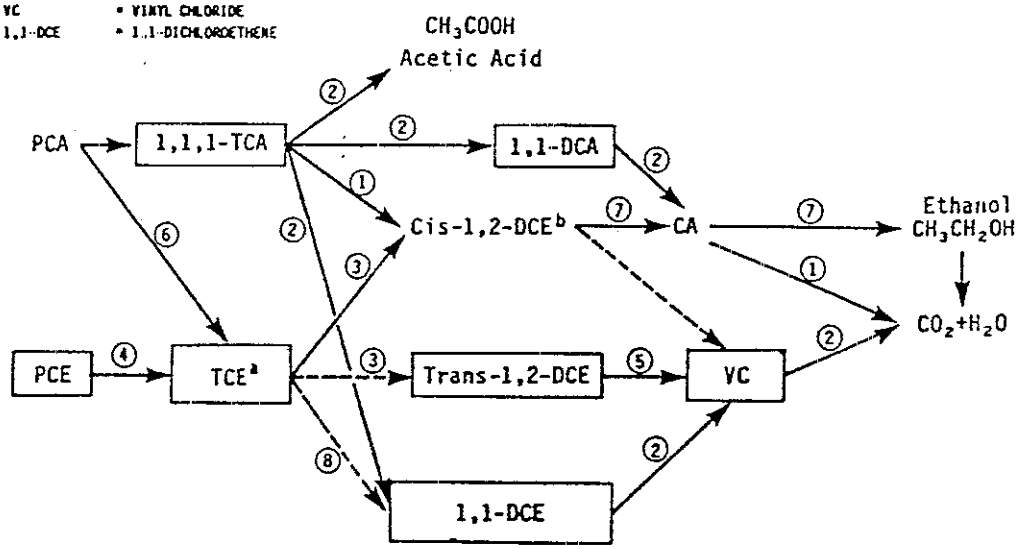
DEPTH, FT.	SAMPLE	BLOWS PER 6"	WELL CONSTR.	USCS SOIL TYPE	DESCRIPTION OF SUBSURFACE MATERIALS
1					Black silty, sandy gravel, brick and concrete fragments. Material too hard to sample.
2					
3				FL	
4					
5					
6		3			Black, moist (oily), very rocky, gravely slag.
7		9			
8		12			7.5-Out of gravely slag
9					
10					
11		2			Dark bluish/gray with oxidation stains. Sandy clay, slight chemical odor.
12		6		CL	
13		8			
14					Water at 14.0'
15					

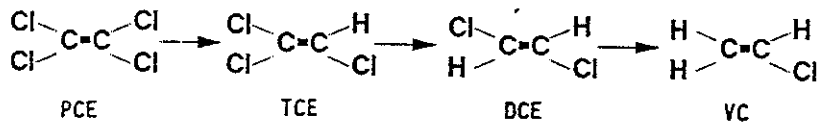
BORING WELL NO. M-14

A

0022

EXPLANATION	
PCA	= TETRACHLOROETHANE
1,1,1-TCA	= 1,1,1-TRICHLOROETHANE
1,1-DCA	= 1,1-DICHLOROETHANE
CIS-1,2-DCE	= CIS-1,2-DICHLOROETHENE
CA	= CHLOROETHANE
PCE	= TETRACHLOROETHENE
TCE	= TRICHLOROETHENE
Trans-1,2-DCE	= Trans-1,2-DICHLOROETHENE
VC	= VINYL CHLORIDE
1,1-DCE	= 1,1-DICHLOROETHENE





K_{oc}			
364	126	59	8.2

PATH REFERENCE	MAJOR MECHANISM	NOTES
(1) McCarty (1986)	Biodegradation	Minor Pathway
(2) Vogel & McCarty (1987 b)		
(3) Kloepler et al (1985)		a Cis 1,2-DCE generated at approximately 30 times the concentration of Trans 1,2-DCE (3) and by a factor of 25:1 (8)
(4) Parsons et al (1984)		
(5) Barrio-Lage et al (1986)		
(6) Cooper et al (1987)	Abiotic Elimination	
(7) Vogel et al (1987)	Biodegradation	
(8) Wood et al (1985)		

souce: unknown

December 1993

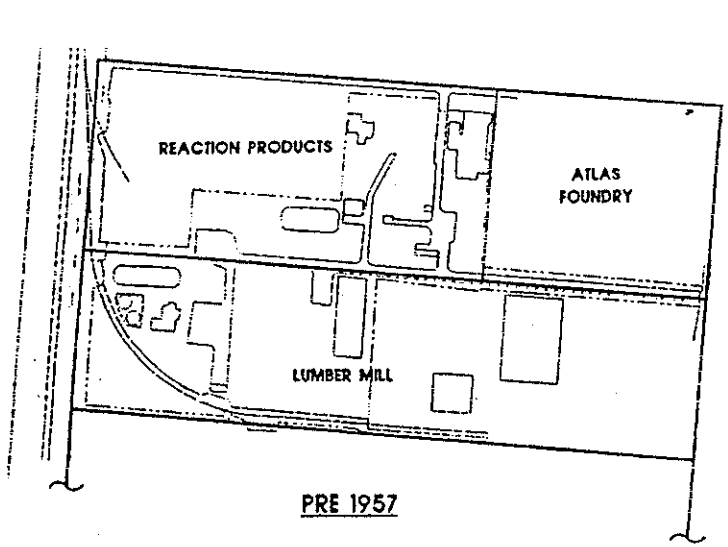
Figure 1.3-1

PCE and TCE Degradation Pathway

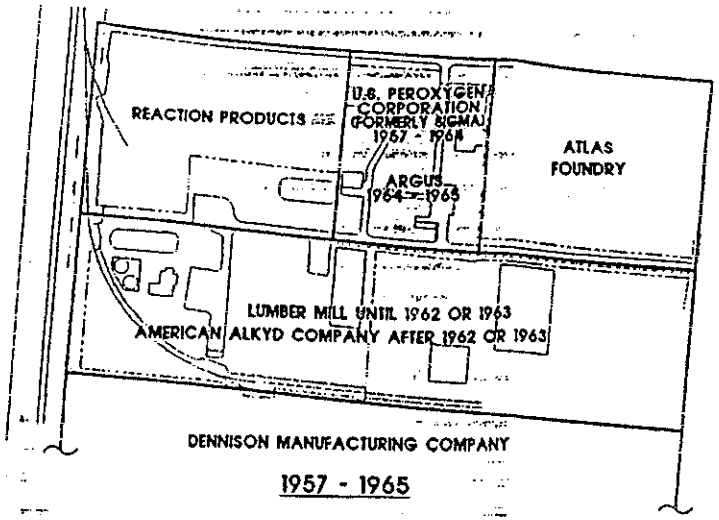
California EPA Department of Toxic Substances Control

Project No. 92C0805F

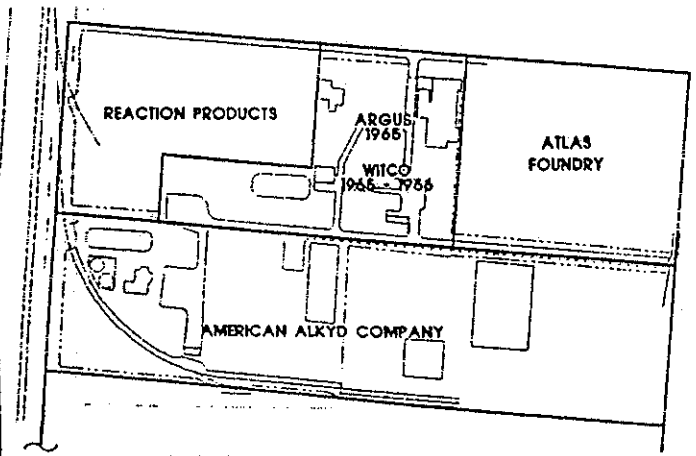
Woodward-Clyde Consultants



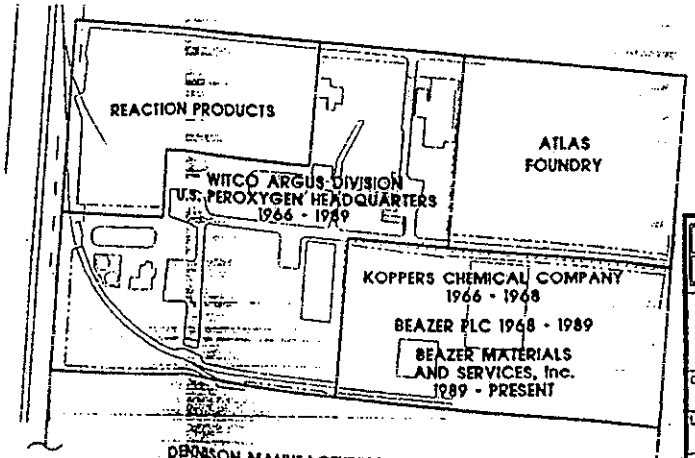
PRE 1957



1957 - 1965



1965 - 1966



1966 - PRESENT

N

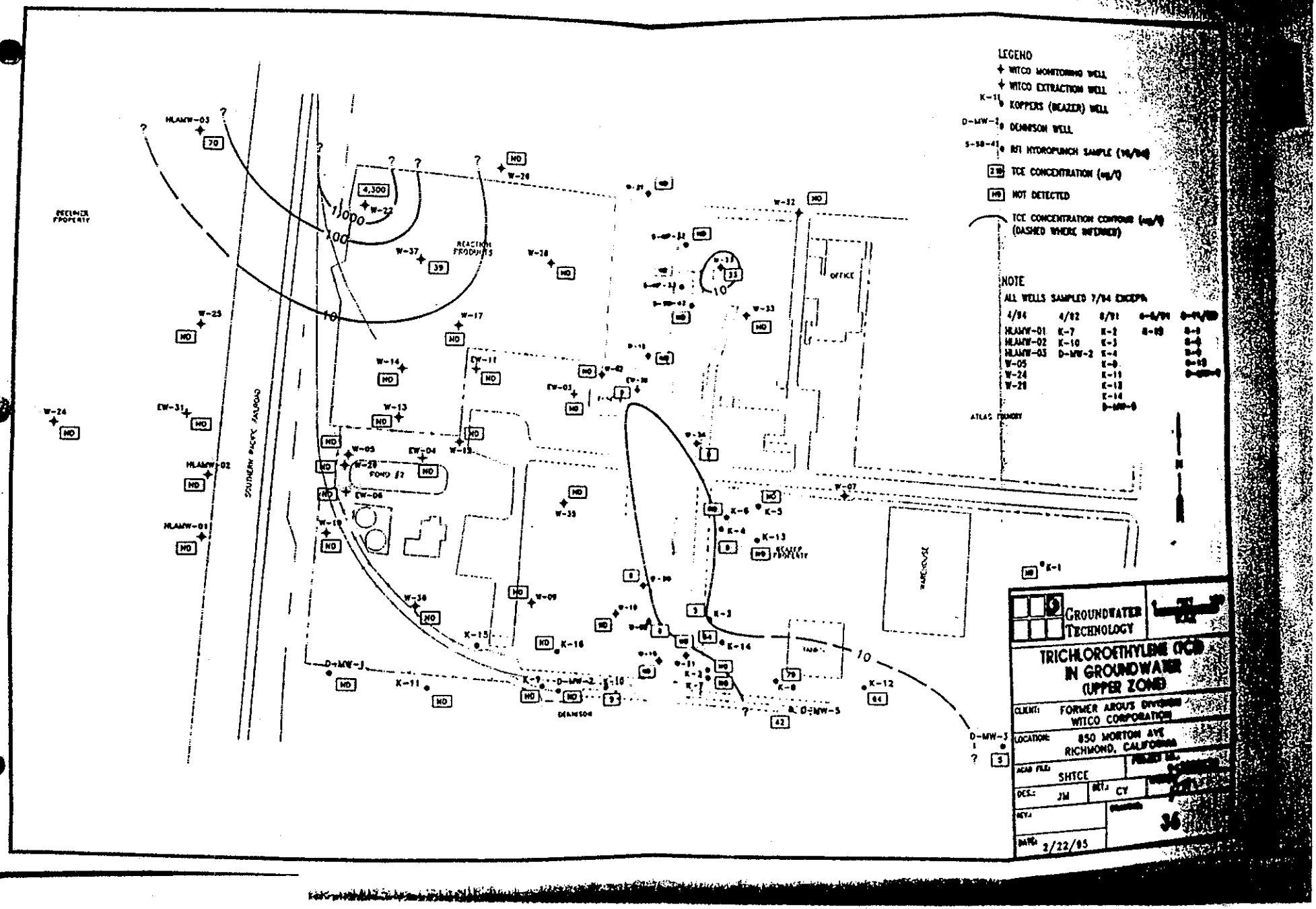
Appendix B Figure B-1
From GTI, 1995

GROUNDWATER TECHNOLOGY

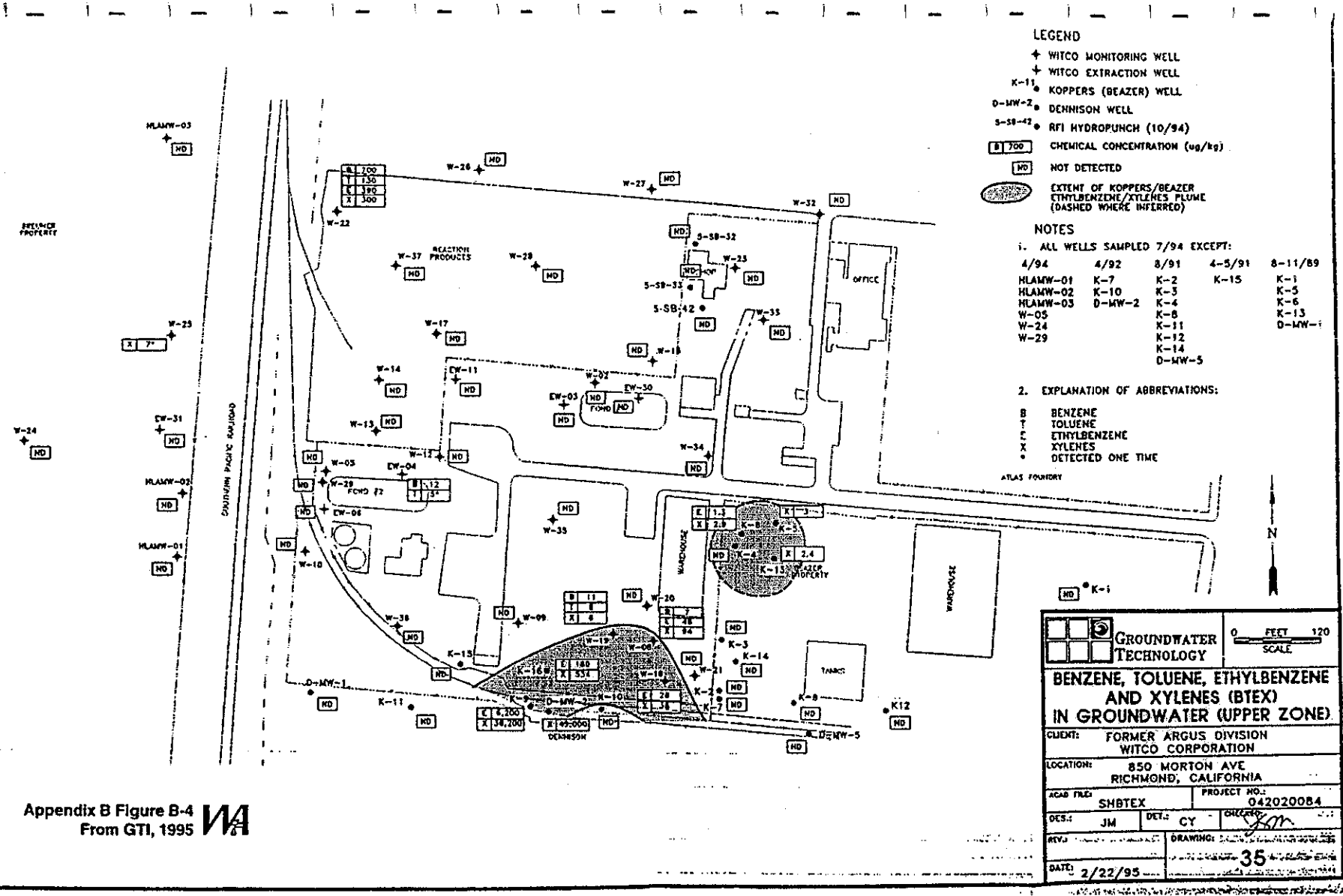
0 FEET 120
SCALE

HISTORY OF SITE DEVELOPMENT WITCO AND ADJACENT SITES

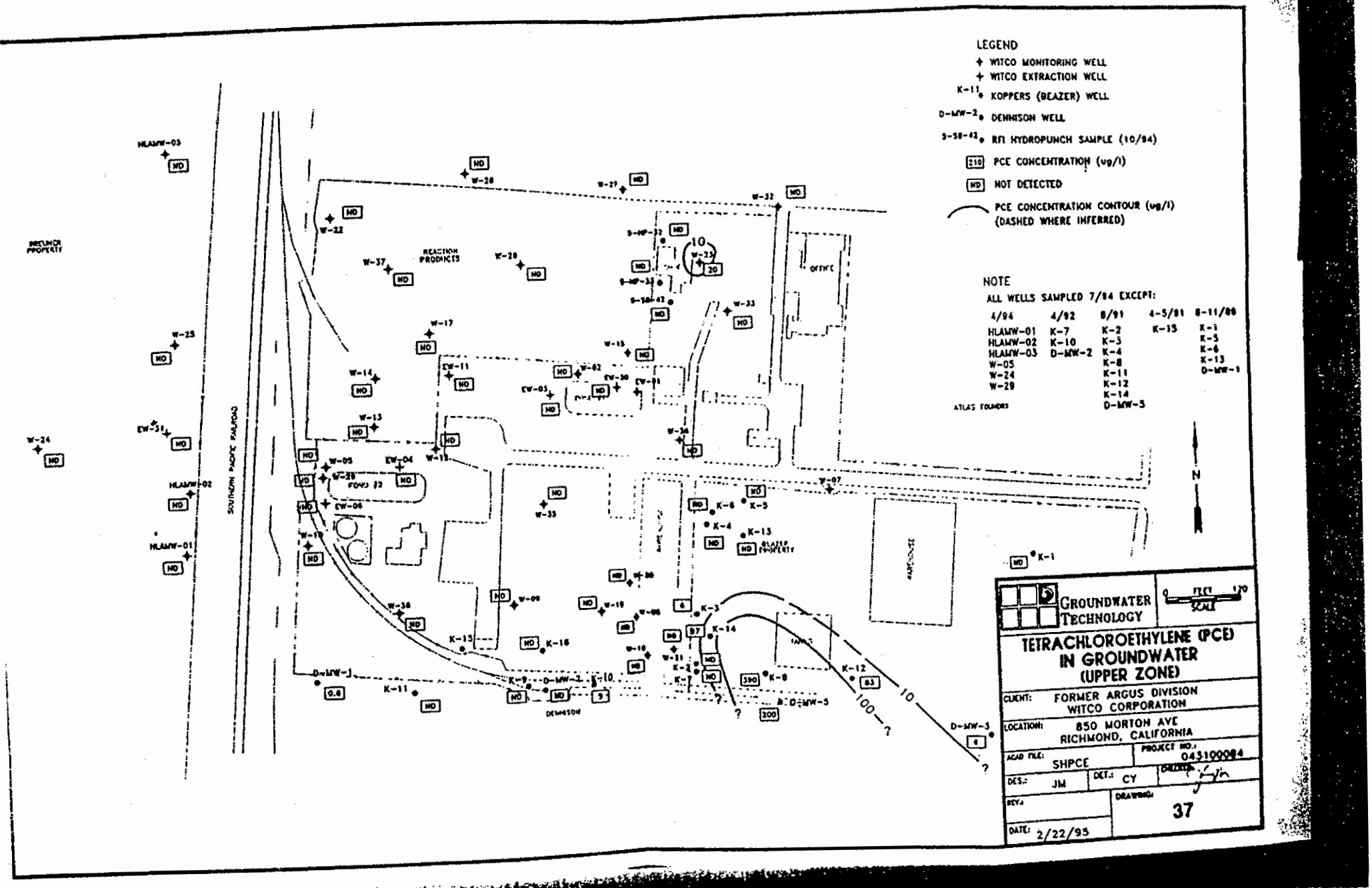
CLIENT:	FORMER ARGUS DIVISION WITCO CORPORATION
LOCATION:	850 MORTON AVE RICHMOND, CALIFORNIA
ACAD FILE: SITEHIST	PROJECT NO.: 043100084
DES.: JM	DFT.: CY
CHECKED: JM	
REV.:	DRAWING: 4
DATE: 1/24/95	



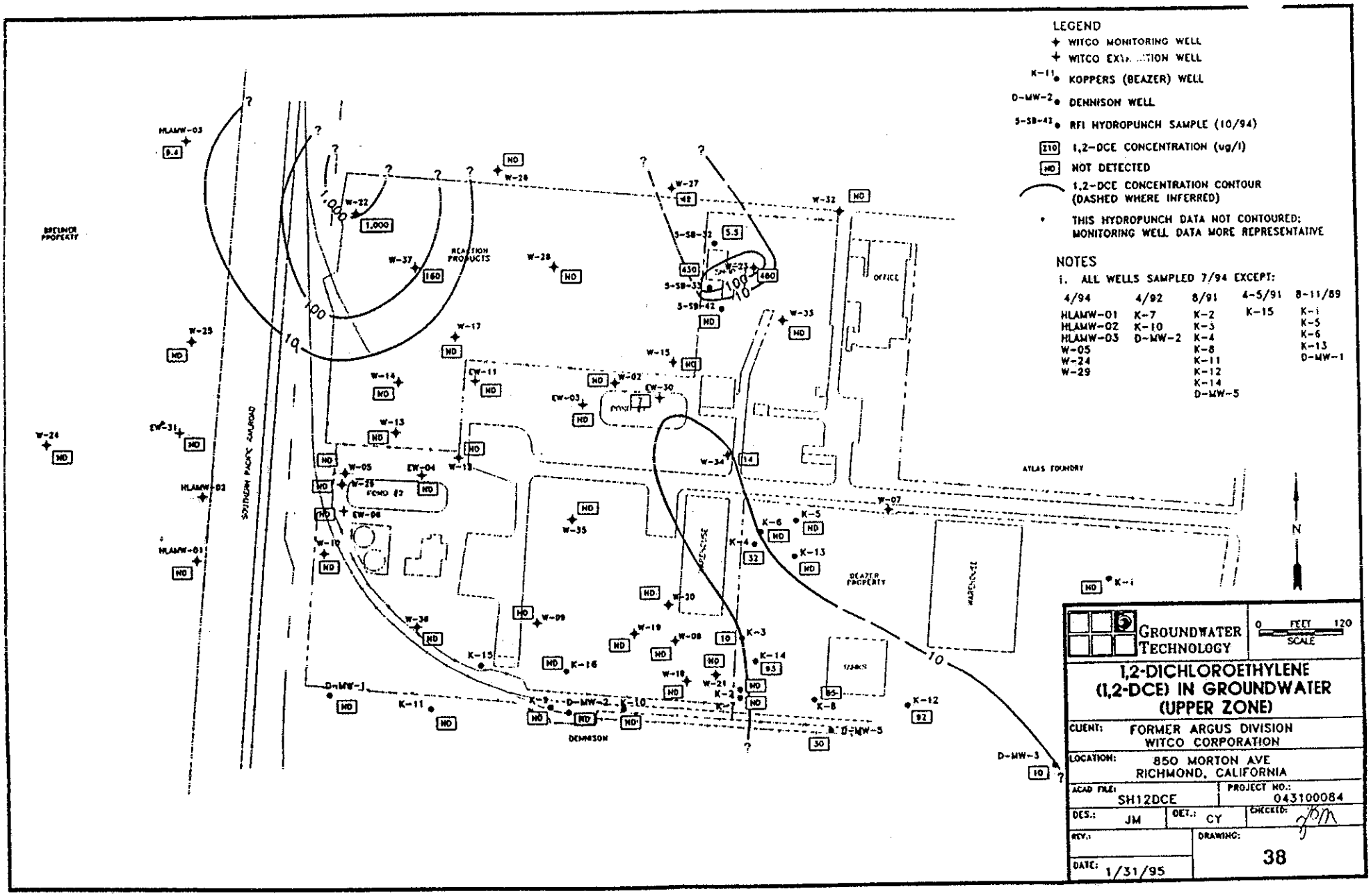
Appendix B Figure B-3
From GTI, 1995



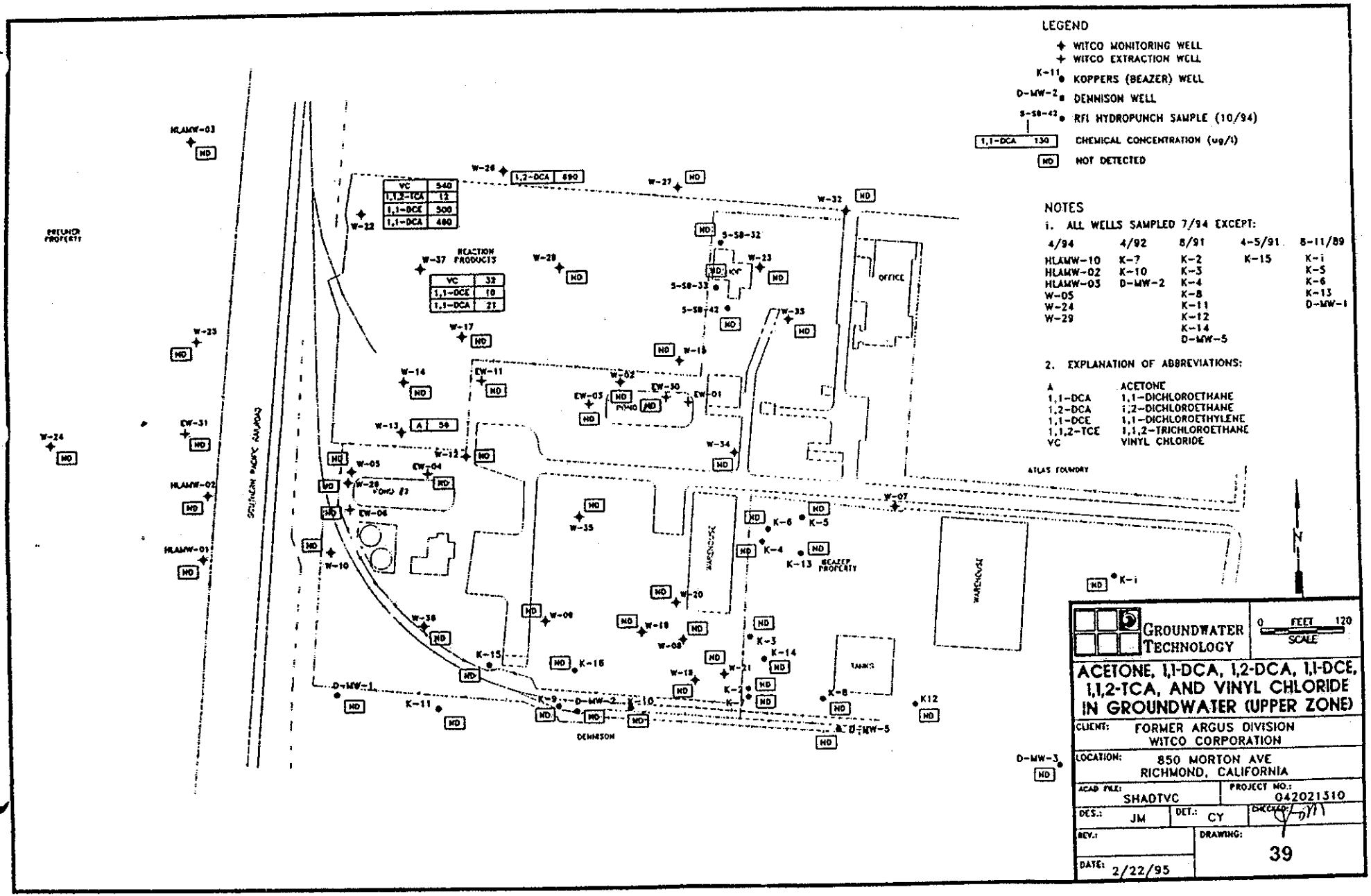
Appendix B Figure B-4
From GTI, 1995



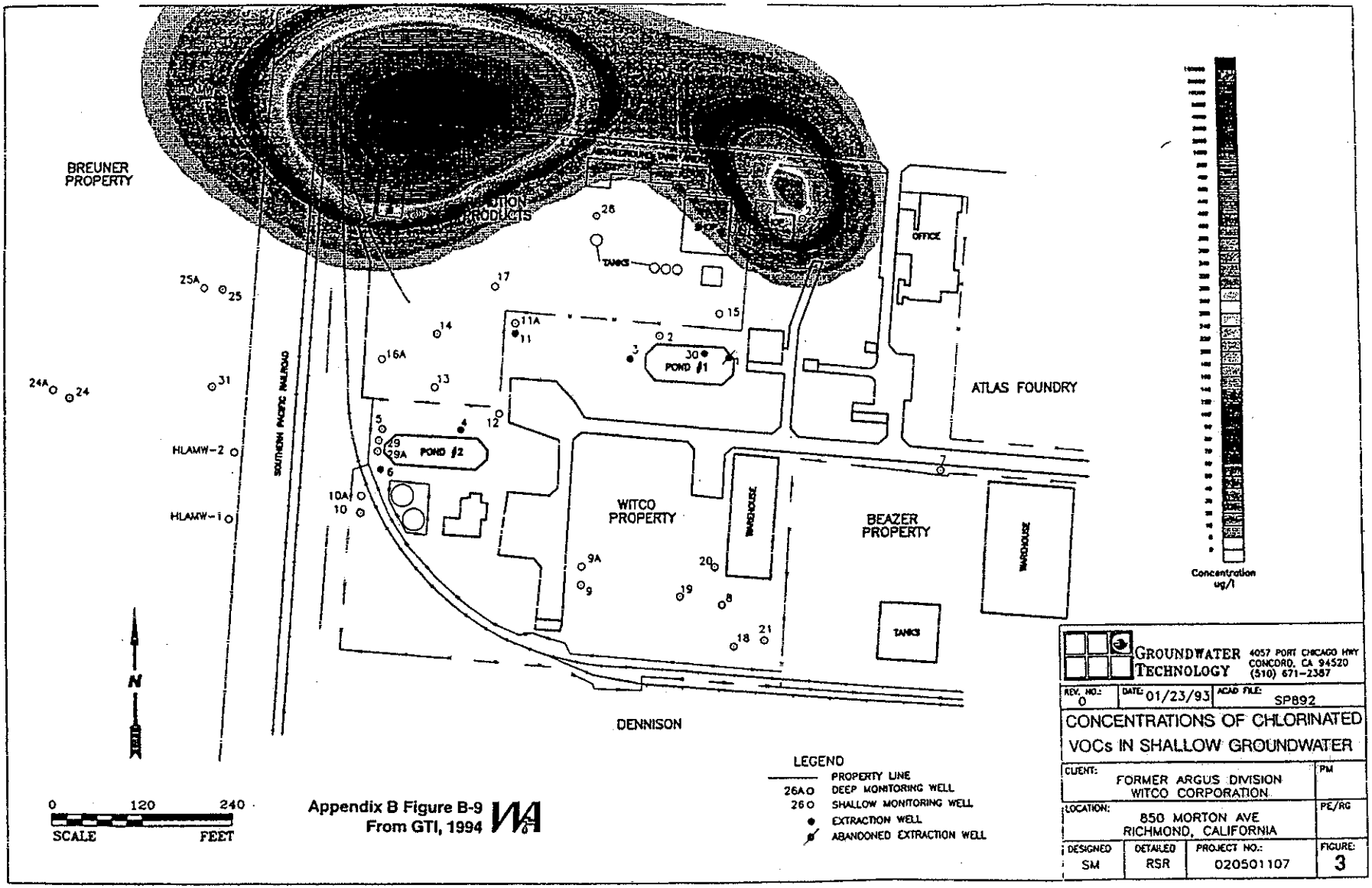
Appendix B Figure B-5
From GTI, 1995



Appendix B Figure B-6
From GTI, 1995



Appendix B Figure B-7
From GTI, 1995



Appendix B Figure B-9
From GTI, 1994

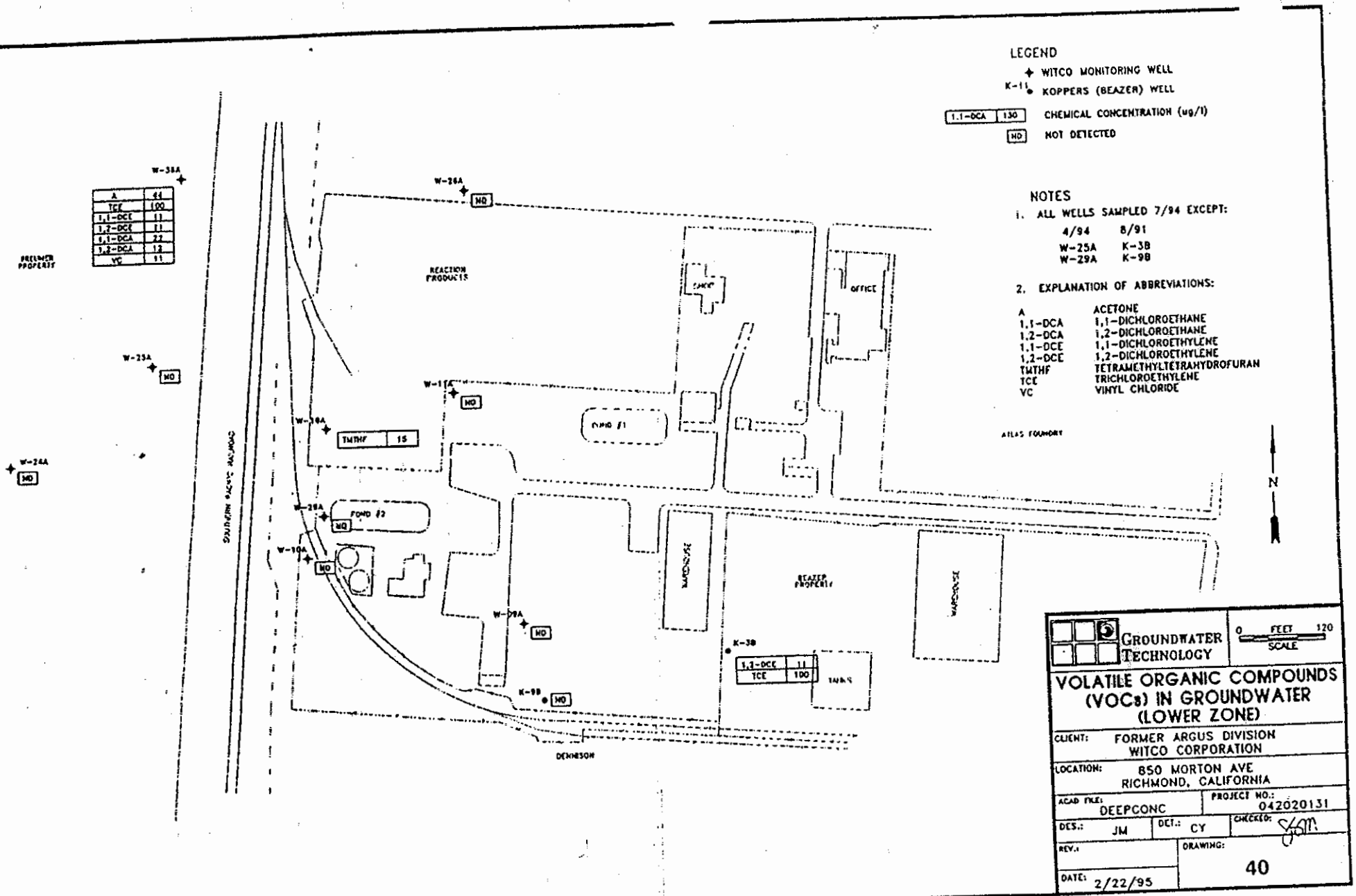
GROUNDWATER TECHNOLOGY
4057 PORT CHICAGO HWY
CONCORD, CA 94520
(510) 671-2387

REV. NO.:	DATE:	ACAD FILE:
0	01/23/93	SP892

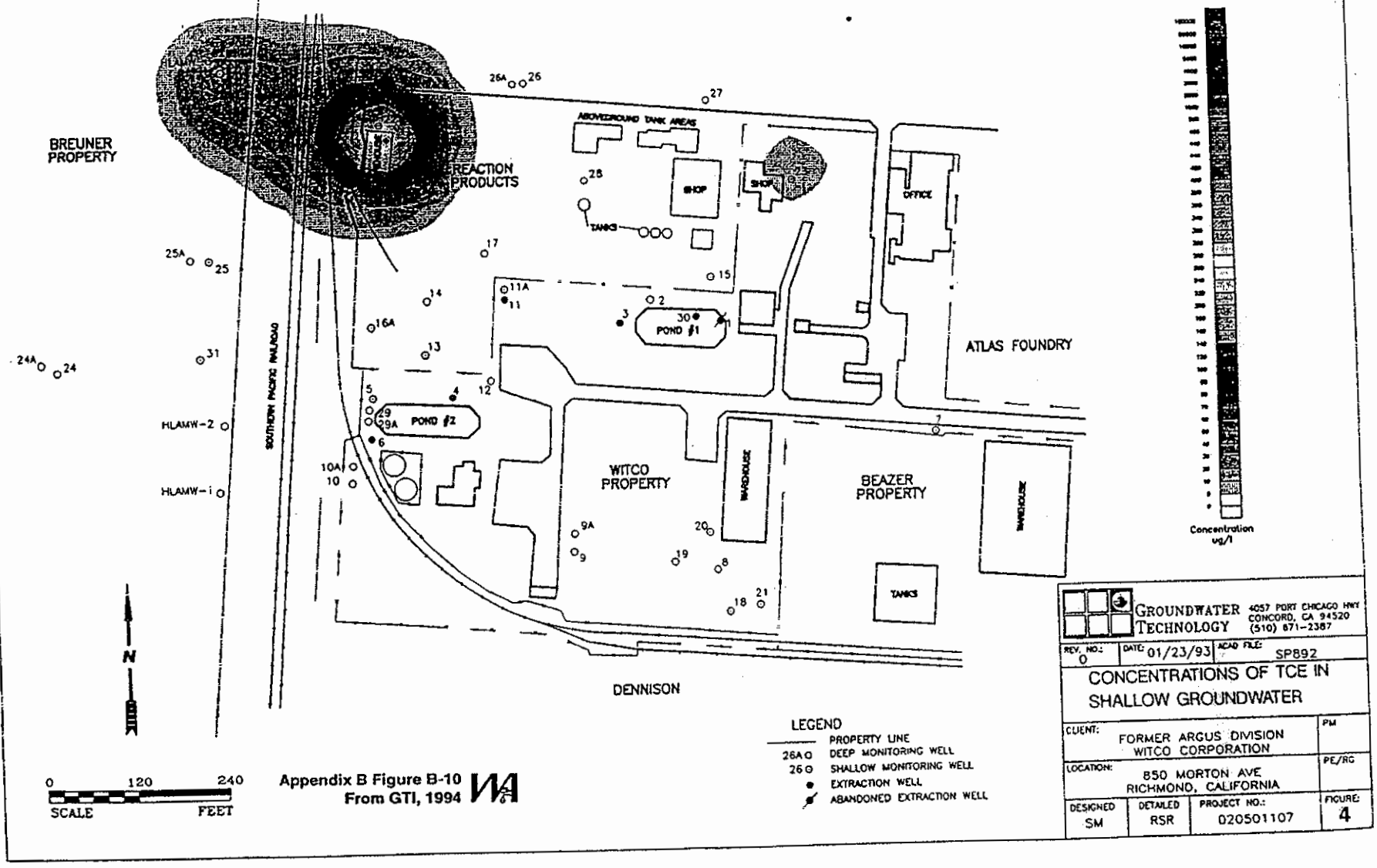
CONCENTRATIONS OF CHLORINATED VOCs IN SHALLOW GROUNDWATER

CLIENT:	PM
FORMER ARGUS DIVISION WITCO CORPORATION	
LOCATION:	PE/RG
850 MORTON AVE RICHMOND, CALIFORNIA	

DESIGNED	DETAILED	PROJECT NO.:	FIGURE:
SM	RSR	020501107	3



Appendix B Figure B-8
From GTI, 1995



Appendix B Figure B-10
From GTI, 1994

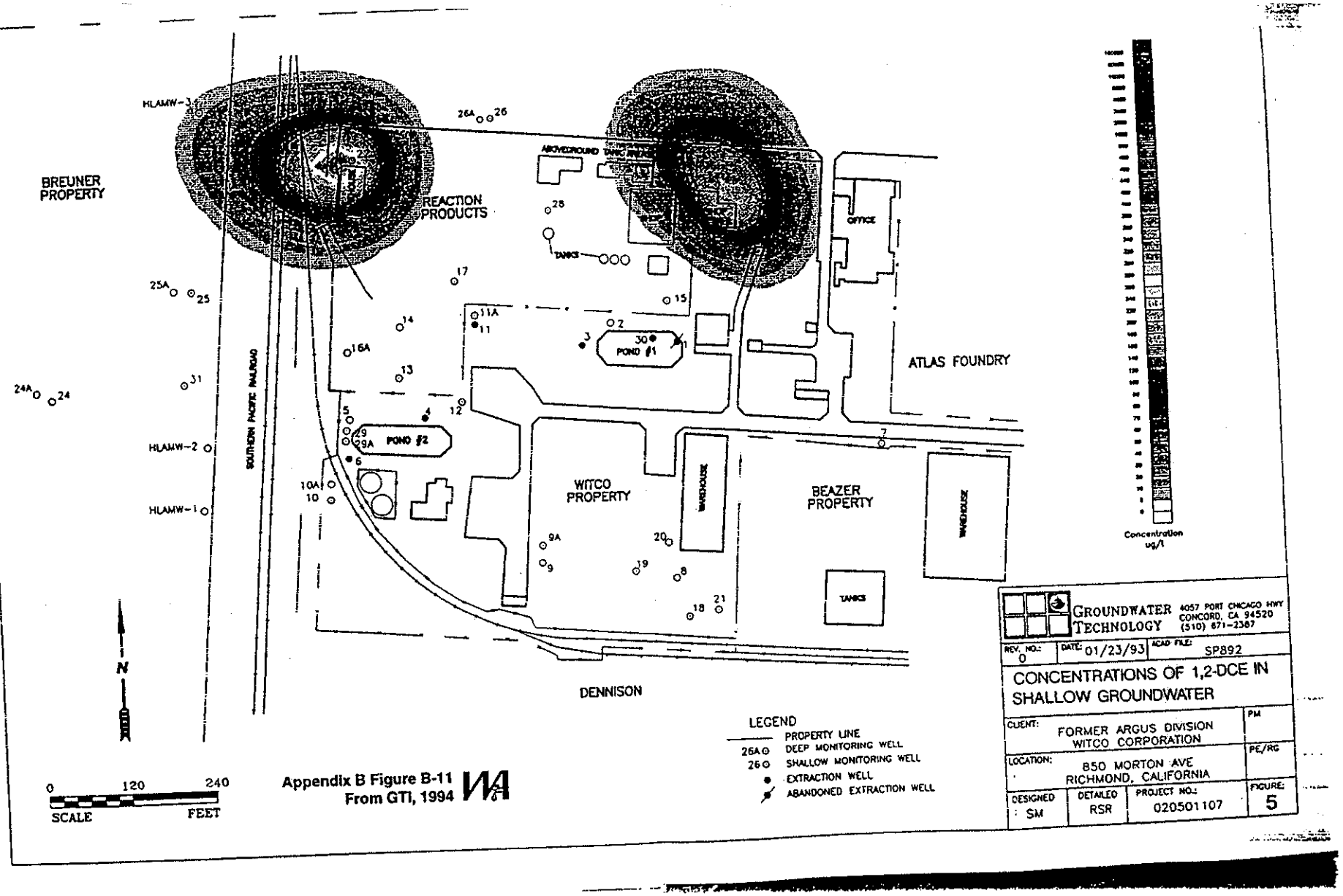
GROUNDWATER TECHNOLOGY
4057 PORT CHICAGO HWY
CONCORD, CA 94520
(510) 671-2387

REV. NO.:	DATE:	ACAD FILE:
0	01/23/93	SP892

CONCENTRATIONS OF TCE IN SHALLOW GROUNDWATER

CLIENT:	PM
FORMER ARGUS DIVISION WITCO CORPORATION	
LOCATION: 850 MORTON AVE RICHMOND, CALIFORNIA	PE/RG

DESIGNED	DETAILED	PROJECT NO.:	FIGURE:
SM	RSR	020501107	4



Appendix B Figure B-11
From GTI, 1994

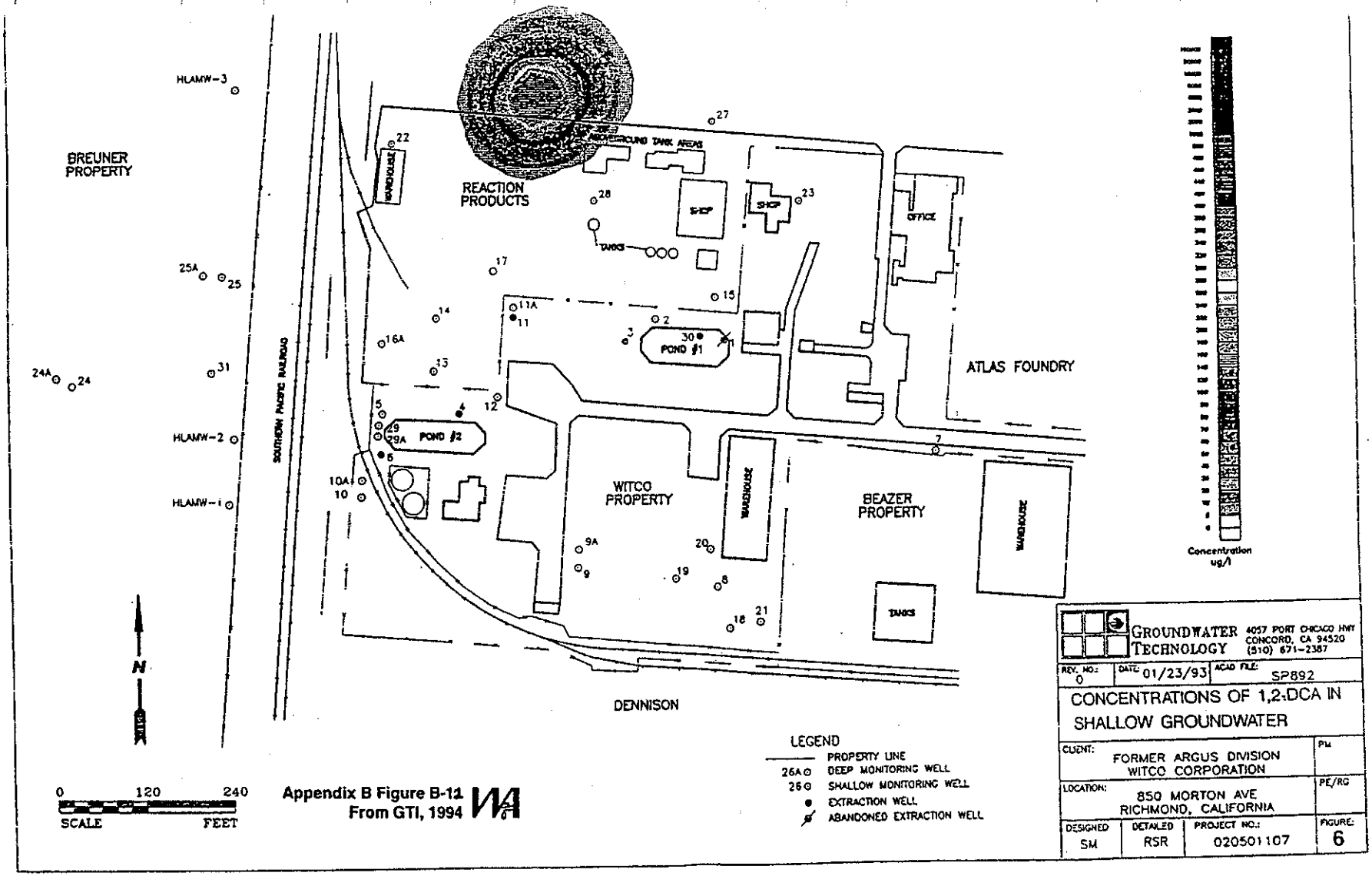
GROUNDWATER TECHNOLOGY
4057 PORT CHICAGO HWY
CONCORD, CA 94520
(510) 671-2367

REV. NO.:	DATE:	ACAD FILE:
0	01/23/93	SP892

CONCENTRATIONS OF 1,2-DCE IN SHALLOW GROUNDWATER

CLIENT:	PM
FORMER ARGUS DIVISION WITCO CORPORATION	
LOCATION: 850 MORTON AVE RICHMOND, CALIFORNIA	PE/RG

DESIGNED	DETAILED	PROJECT NO.:	FIGURE:
SM	RSR	020501107	5



Appendix B Figure B-11
From GTI, 1994

GROUNDWATER TECHNOLOGY
4057 PORT CHICAGO HWY
CONCORD, CA 94520
(510) 671-2387

REV. NO.:	DATE:	ACAD FILE:
0	01/23/93	SP892

CONCENTRATIONS OF 1,2-DCA IN SHALLOW GROUNDWATER

CLIENT: FORMER ARGUS DIVISION WITCO CORPORATION	PM
LOCATION: 850 MORTON AVE RICHMOND, CALIFORNIA	PE/RG

DESIGNED	DETAILED	PROJECT NO.:	FIGURE:
SM	RSR	020501107	6

APPENDIX C
REMEDIATION INFORMATION

REGENESIS

February 23, 2004 **Proposal No. 0KL0304-93H**

Aaron Stessman
CSS Environmental Services, Inc.
95 Belvedere Street, Suite 2
San Rafael, CA 94901
E-mail: astessman@prodigy.net

Subject: Application of Hydrogen Release Compound (HRC®) and Oxygen Release Compound (ORC®) to Accelerate the Natural Attenuation of Contaminants of Concern (COCs) at the Reaction Products Site

Dear Mr. Stessman:

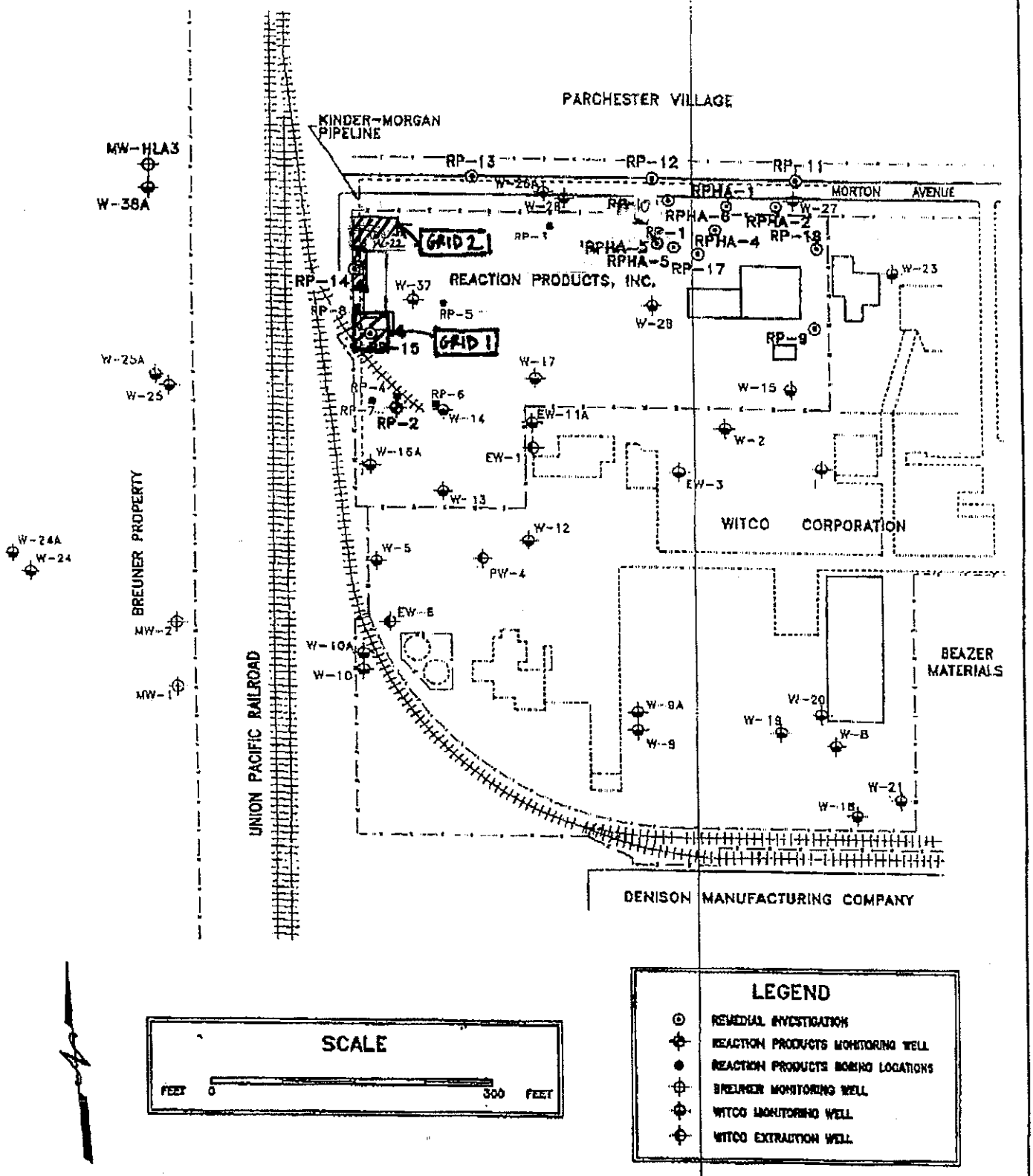
Thank you for your interest in Regenesis and our Hydrogen Release Compound (HRC®) and Oxygen Release Compound (ORC®) products. We have reviewed the information that you provided for the above-referenced site. In the following sections of this proposal we will discuss the use of HRC and ORC, design and cost information, delivery of the products to the subsurface, a recommended groundwater monitoring program and the performance goals for this particular project. In addition, this proposal should be considered preliminary because some assumptions were made regarding the current biogeochemical conditions of the aquifer and the extent of the contaminant plume requiring treatment. We look forward to working with you on developing a site-specific strategy that will help meet your objectives for the site.

Use of Hydrogen Release Compound (HRC®) and Oxygen Release Compound (ORC®) to Accelerate Bioremediation

HRC

HRC is proprietary polylactate ester that is manufactured as a viscous gel and has a consistency similar to that of cold honey. HRC slowly releases lactate when it is hydrated. Naturally occurring microorganisms create hydrogen and reducing conditions in the aquifer when they metabolize lactate and facilitate a process known as reductive dechlorination. Reductive dechlorination is one of the primary attenuation mechanisms by which chlorinated solvent groundwater plumes can be stabilized and/or remediated.

HRC is used to accelerate the *in-situ* biodegradation rates of chlorinated hydrocarbons (CHs) via anaerobic reductive dechlorination processes. The indigenous microorganisms capable of reductive dechlorination use the hydrogen to progressively remove chlorine atoms from chlorinated hydrocarbon contaminants. In general, reductive dechlorination of ethenes occurs by way of sequential dechlorination from perchloroethene (PCE) to trichloroethene (TCE) to dichloroethene (DCE) then to vinyl chloride (VC) and finally to ethene



CSS ENVIRONMENTAL SERVICES, INC

SITE PLAN
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

FIGURE 2

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	04/01	6103SITE	BED	4/02

HRC Design Software for Plume Area/Grid Treatment

US Version 3.1

Regenesis Technical Support: USA (949) 366-8000 www regenesis com

Site Name: Reaction Products (Grid 1B)
Location: Richmond, CA
Consultant: CSS Env Services

Site Conceptual Model/Extent of Plume Requiring Remediation

Width of plume (intersecting gw flow direction)	40	ft			
Length of plume (parallel to gw flow direction)	40	ft	=	1,600	sq ft
Depth to contaminated zone	8	ft			
Thickness of contaminated saturated zone	15	ft			
Nominal aquifer soil (gravel sand silty sand silt clay)	clay				
Total porosity	0.3		Eff porosity:	0.25	
Hydraulic conductivity	0.001	ft/day	=	3.5E-07	cm/sec
Hydraulic gradient	0.005	ft/ft			
Seepage velocity	0.0	ft/yr	=	0.000	ft/day,
Treatment Zone Pore Volume	7,200	ft^3	=	53,863	gallons

Dissolved Phase Electron Donor Demand

	Contaminant Conc (mg/L)	Contaminant Mass (lb)	Stoich (wt/wt) contam/H_2
Tetrachloroethene (PCE)	0.00	0.0	20.7
Trichloroethene (TCE) DNAPL? Consider inc add dem factor	59.00	26.5	21.9
cis-1 2-dichloroethene (DCE)	13.00	5.8	24.2
Vinyl Chloride (VC)	0.00	0.0	31.2
Carbon tetrachloride	0.00	0.0	19.2
Chloroform	0.00	0.0	19.9
1 1 1-Trichloroethane (TCA)	0.00	0.0	22.2
1 1-Dichlorochloroethane (DCA)	0.00	0.0	24.7
Hexavalent Chromium	0.00	0.0	38.7
User added also add stoichiometric demand	0.00	0.0	0.0
User added also add stoichiometric demand	0.00	0.0	0.0

Sorbed Phase Electron Donor Demand

Soil bulk density	1.76	g/cm^3 =	110	lb/cf
Fraction of organic carbon: foc	0.005	range: 0 0001 to 0 01		

(Values are estimated using Soil Conc=foc*Koc*Cgw) (Adjust Koc as nec. to provide realistic estimates)	Koc (L/kg)	Contaminant Conc (mg/kg)	Contaminant Mass (lb)	Stoich. (wt/wt) contam/H_2
Tetrachloroethene (PCE)	263	0.00	0.0	20.7
Trichloroethene (TCE)	107	31.57	83.2	21.9
cis-1 2-dichloroethene (DCE)	80	5.20	13.7	24.2
Vinyl Chloride (VC)	2.5	0.00	0.0	31.2
Carbon tetrachloride	110	0.00	0.0	19.2
Chloroform	34	0.00	0.0	19.9
1 1,1-Trichloroethane (TCA)	183	0.00	0.0	22.2
1,1-Dichlorochloroethane (DCA)	183	0.00	0.0	24.7
User added also add stoichiometric demand	0	0.00	0.0	0.0
User added also add stoichiometric demand	0	0.00	0.0	0.0

Competing Electron Acceptors

	Electron Acceptor Conc (mg/L)	Electron Acceptor Mass (lb)	Stoich (wt/wt) elec acceptor/H_2
Oxygen	2.00	1	8.0
Nitrate	1.00	0	12.4
Est Mn reduction demand (potential amt of Mn2+ formed)	1.00	0	27.5
Est. Fe reduction demand (potential amt of Fe2+ formed)	1.00	0	55.9
Estimated sulfate reduction demand	140.00	63	12.0

Microbial Demand Factor	3	Recommend 1-4x
Safety Factor	2	Recommend 1-4x

Injection Point Spacing and Dose:

Injection spacing within rows (ft)	8.0	# points per row:	5
Injection spacing between rows (ft)	8.0	# of rows:	5
Advective travel time bet. rows (days)	400000	Total # of points:	25
		Minimum req HRC dose per foot (lb/ft)	6.9

Project Summary			
Number of HRC delivery points (adjust as nec for site)		25	
HRC Dose in lb/foot (adjust as nec. for site)		7.0	
Corresponding amount of HRC per point (lb)		105	
Number of 30 lb HRC Buckets per injection point		3.5	
Total Number of 30 lb Buckets		88	
Total Amt of HRC (lb)		2,640	
HRC Cost	$	6.00	List Price has been adjusted
Total Material Cost	**$**	**15,840**	
Shipping and Tax Estimates in US Dollars			
Sales Tax rate: 0%	$	-	
Total Matl. Cost	$	15,840	
Shipping of HRC (call for amount)	$	-	
Total Regenesis Material Cost	**$**	**15,840**	

HRC Installation Cost Est. (responsibility of customer to contract work)			**Other Project Costs**		
Footage for each inj. point = uncontaminated + HRC inj interval (ft)		23	Design and regulatory issues	$	-
Total length for direct push for project (ft)		575	Groundwater monitoring and rpt	$	-
Estimated daily installation rate (ft per day. 500 for push. 200 for drilling)		400	Other	$	-
Estimated points per day (10 to 20 is typical for direct push)		17 4	Other	$	-
Required number of days		2	Other	$	-
Mob/demob cost for injection subcontractor	$	1 000	Other	$	-
Daily rate for inj. Sub. ($1-2K for push $3-4K for drill rig)	$	1 500	Other	$	-
Total injection subcontrator cost for application	$	4,000	Other	$	-
Total Install Cost (not inc. consultant, lab, etc.)	**$**	**19,840**	**Total Project Cost**	**$**	**19,840**

HRC Design Software for Plume Area/Grid Treatment

US Version 3 1

Regenesis Technical Support: USA

Site Name: Reaction Products (Grid 2)
Location: Richmond, CA
Consultant: CSS Env Services

* INJECT BTW. 20-30' bgs PER W-22 LOG.

Site Conceptual Model/Extent of Plume Requiring Remediation

Width of plume (intersecting gw flow direction)	40	ft			
Length of plume (parallel to gw flow direction)	30	ft	=	1,200	sq ft
Depth to contaminated zone	8	ft			
Thickness of contaminated saturated zone	15	ft			
Nominal aquifer soil (gravel sand silty sand silt clay)	clay				
Total porosity	0.3		Eff porosity:	0.25	
Hydraulic conductivity	0.001	ft/day	=	3.5E-07	cm/sec
Hydraulic gradient	0.005	ft/ft			
Seepage velocity	0.0	ft/yr	=	0.000	ft/day,
Treatment Zone Pore Volume	5,400	ft^3	=	40,397	gallons

Dissolved Phase Electron Donor Demand	Contaminant Conc (mg/L)	Contaminant Mass (lb)	Stoich. (wt/wt) contam/H_2
Tetrachloroethene (PCE)	0.00	0.0	20.7
Trichloroethene (TCE)	1.90	0.6	21.9
cis-1 2-dichloroethene (DCE)	0.40	0.1	24.2
Vinyl Chloride (VC)	0.00	0.0	31.2
Carbon tetrachloride	0.00	0.0	19.2
Chloroform	0.00	0.0	19.9
1 1 1-Trichloroethane (TCA)	0.00	0.0	22.2
1 1-Dichlorochloroethane (DCA)	0.09	0.0	24.7
Hexavalent Chromium	0.00	0.0	38.7
User added also add stoichiometric demand	0.00	0.0	0.0
User added also add stoichiometric demand	0.00	0.0	0.0

Sorbed Phase Electron Donor Demand

Soil bulk density	1.76	g/cm^3	=	110	lb/cf
Fraction of organic carbon: foc	0.005	range: 0 0001 to 0.01			

(Values are estimated using Soil Conc=foc*Koc*Cgw) (Adjust Koc as nec. to provide realistic estimates)	Koc (L/kg)	Contaminant Conc (mg/kg)	Contaminant Mass (lb)	Stoich. (wt/wt) contam/H_2
Tetrachloroethene (PCE)	263	0.00	0.0	20.7
Trichloroethene (TCE)	107	1.02	2.0	21.9
cis-1 2-dichloroethene (DCE)	80	0.16	0.3	24.2
Vinyl Chloride (VC)	2.5	0.00	0.0	31.2
Carbon tetrachloride	110	0.00	0.0	19.2
Chloroform	34	0.00	0.0	19.9
1 1,1-Trichloroethane (TCA)	183	0.00	0.0	22.2
1 1-Dichlorochloroethane (DCA)	183	0.08	0.2	24.7
User added also add stoichiometric demand	0	0.00	0.0	0.0
User added also add stoichiometric demand	0	0.00	0.0	0.0

Competing Electron Acceptors	Electron Acceptor Conc (mg/L)	Electron Acceptor Mass (lb)	Stoich. (wt/wt) elec acceptor/H_2
Oxygen	2.00	1	8.0
Nitrate	1.00	0	12.4
Est Mn reduction demand (potential amt of Mn2+ formed)	1.00	0	27.5
Est. Fe reduction demand (potential amt of Fe2+ formed)	1.00	0	55.9
Estimated sulfate reduction demand	140.00	47	12.0

Microbial Demand Factor	3	Recommend 1-4x
Safety Factor	2	Recommend 1-4x

Injection Point Spacing and Dose:

Injection spacing within rows (ft)	10.0	# points per row:	4	
Injection spacing between rows (ft)	10.0	# of rows:	3	
Advective travel time bet rows (days)	500000	Total # of points:	12	
		Minimum req HRC dose per foot (lb/ft)	4.0	= Minumum Dose

Project Summary			
Number of HRC delivery points (adjust as nec for site)			12
HRC Dose in lb/foot (adjust as nec. for site)			4.0 = Minumum Dose Override
Corresponding amount of HRC per point (lb)			60
Number of 30 lb HRC Buckets per injection point			2.0
Total Number of 30 lb Buckets			24
Total Amt of HRC (lb)			720
HRC Cost		$	7.50
Total Material Cost		**$**	**5,400**
Shipping and Tax Estimates in US Dollars			
Sales Tax	rate: 0%	$	-
Total Matl. Cost		$	5 400
Shipping of HRC (call for amount)		$	-
Total Regenesis Material Cost		**$**	**5,400**

HRC Installation Cost Est. (responsibility of customer to contract work)			**Other Project Costs**		
Footage for each inj. point = uncontaminated + HRC inj. interval (ft)		23	Design and regulatory issues	$	-
Total length for direct push for project (ft)		276	Groundwater monitoring and rpt	$	-
Estimated daily installation rate (ft per day: 500 for push, 200 for drilling)		400	Other	$	-
Estimated points per day (10 to 20 is typical for direct push)		17.4	Other	$	-
Required number of days		1	Other	$	-
Mob/demob cost for injection subcontractor	$	1 000	Other	$	-
Daily rate for inj. Sub. ($1-2K for push $3-4K for drill rig)	$	1 500	Other	$	-
Total injection subcontrator cost for application	$	2,500	Other	$	-
Total Install Cost (not inc. consultant, lab, etc.)	**$**	**7,900**	**Total Project Cost**	**$**	**7,900**

design and regulatory oversight issues are finalized For example, the following design parameters may need to be adjusted prior to the implementation:

- Treatment areas may need to be increased or decreased depending on the overall site remediation strategy
- The final delivery locations may need to be adjusted to account for site features such as underground utilities and other site structures

The Regenesis Technical Services Group can assist your company in the selection of an appropriate final design.

Preliminary Design and Cost Information for Full Scale Remediation

Based on the provided data and earlier conversations with you, Regenesis understands that the full-scale treatment at the subject site will consist of a grid-based design approach. There are three areas of primary concern at the site: 1) Area 1 (the vicinity of RP-15), which contains elevated levels of TCE and 1,1-DCE, 2) Area 2 (the vicinity of RP-14), which contains significant levels of TCE as well as hits of DCE and DCA, and 3) Area 3 (the vicinity of RP-1), which contains significant levels of 1,2-DCA (see attached figure) Because of the presence of TCE, we recommend treating Areas 1 and 2 with HRC However, because 1,2-DCA is the only contaminant present in Area 3, we recommend going with ORC in that area to aerobically degrade the 1,2-DCA. Also, because of the varying contaminant concentrations between the upper and lower aquifers in Area 1, we recommend different application rates to correspond to each aquifer's contaminant level (the upper aquifer in Area 1 will be referred to as 1a and the lower aquifer will be referred to as 1b). This treatment strategy should reduce the levels of COCs in the target zones and downgradient. The design specifications for this treatment approach are found in the following table:

HRC Grid Treatment	
Design Feature	**Specification**
Saturated thickness requiring treatment	Grid 1a: 17 feet Grid 1b: 15 feet Grid 2: 15 feet
Treatment area	Grid 1: 40 feet x 40 feet Grid 2: 40 feet x 30 feet
Delivery point spacing and configuration	Grid 1: 8 ft-on-center, 25 total points Grid 2: 10 ft-on-center, 12 total points
HRC dose rate in lbs/vertical foot of injection	Grid 1a: ~ 4.1 lbs/foot (70 lbs/point) Grid 1b: 7 lbs/foot (105 lbs/point) Grid 2: 4 lbs/foot (60 lbs/point)
HRC material requirement	Grid 1a: 25 pts x 17 feet x 4.1 lbs/ft = 1,750 lbs Grid 1b: 25 pts x 15 feet x 7 lbs/ft = 2,625 lbs

HRC Groundwater Monitoring Parameters – Field or Lab	
Analyte	**Method**
pH, dissolved oxygen (DO), oxidation/reduction potential (ORP), temperature	**Meter reading taken in flow-through cell (DO can also be measured with a Hach field test kit)**
Total and dissolved iron and manganese	**Colorimetric Hach Method or EPA 6000 series with filtered and unfiltered samples**
Sulfide	**Colorimetric Hach Method or EPA 376.2**

The following tables outline the parameters and methods that should be used to monitor the progress of an ORC-based project.

ORC Monitoring Parameters – Field or Lab	
Analyte	**Method**
Volatile Organic Compounds (VOCs)	EPA 8260
pH, DO, ORP, temperature	Meter reading taken in flow-through cell (DO can also be measured with a Hach kit)
Total and dissolved iron and manganese	Colorimetric Hach Method or EPA 6000 series with filtered and unfiltered samples
Carbon Dioxide, Methane, Ethane, Ethene (all optional)	ASTM D1945

Groundwater Monitoring Locations

The following table outlines the suggested locations and significance of monitoring wells used to monitor the progress of enhanced bioremediation projects.

Location	Significance
Background (Outside the groundwater plume)	Allows for the changes in natural attenuation conditions induced by addition of ORC and HRC to be compared to background levels
Upgradient of treatment zone	Provides a measure of contaminant and competing electron acceptor flux entering treatment zone
Inside treatment zone	Provides information on how ORC and HRC is affecting the aquifer conditions and contaminant concentrations

PRICE SHEET

To order call 949-366-8000
fax 949-366-8090

Effective Date: April 4, 2003

Hydrogen Release Compound (HRC®) offers a passive, low-cost approach to rapid remediation of chlorinated solvent impacted sites. HRC is a proprietary, environmentally safe polylactate ester specially formulated for slow release of lactic acid upon hydration. When placed within a contaminated aquifer, HRC stimulates a multi-step process resulting in the degradation of chlorinated solvent compounds such as PCE, TCE and their derivatives as well as other groundwater contaminants.

HRC Pricing*

Regenesis offers a volume discount structure for the purchase of HRC as follows:

Quantity (lbs.)	HRC Price/lb. (US $)	Quantity (lbs.)	HRC Price/lb. (US $)
150	$8.00	6,000	$5.75
500	$7.50	10,000	$5.50
1,500	$7.00	20,000	$5.25
3,000	$6.00	40,000	$5.00

* HRC is shipped in four-and-a-quarter gallon containers weighing approximately 30 pounds. Material Safety Data Sheet is included with each shipment.

Freight – All freight is FOB San Clemente, CA unless otherwise specified when order is placed.

Minimum Order – 150 lbs. ($1200.00)

Bench-Scale Laboratory Testing

Laboratory testing of soil and groundwater is available to confirm the ability of HRC to stimulate dechlorination. However, such testing is generally not required. Testing cost is $3,500 per groundwater/soil slurry sample.

Payment Terms – Net 30 days. Accounts outstanding after 30 days will be assessed 1.5% interest per month. Accounts outstanding over 90 days will be re-invoiced at the undiscounted price of $8.00 per pound.

Return Policy – A 15% restocking fee will be charged for all returned product. Return freight must be prepaid. All requests to return product must be pre-approved by Regenesis. Returned product must be in original condition and no product will be accepted for return after a period of 90 days from time of delivery.

Terms & Conditions – Other terms and conditions are on reverse side.

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Los Angeles, CA 90084-8873

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APPENDIX D

PUBLIC DRINKING WATER SYSTEM INFORMATION

CUROCO CORPORATION

UROCO CORPORATION CAS, 0905554 i

atitude: 37 58 27 Longitude: 122 20 29.55, RICHMOND, CA 94801

EPA
Region 9 GIS Center

)UCED BY: USEPA Region 9 GIS Center
c September 16 1999

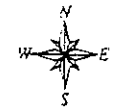
)URCES:
:pulation Density:
94-171, Bureau of the Census. 1990 Census
inking Water Supply:
lifornia Dept of Health, 1998
ndangered/Threatened Species:
tural Diversity Database Ca. Dept of Fish & Game, 1998

Drinking Water Supply Wells

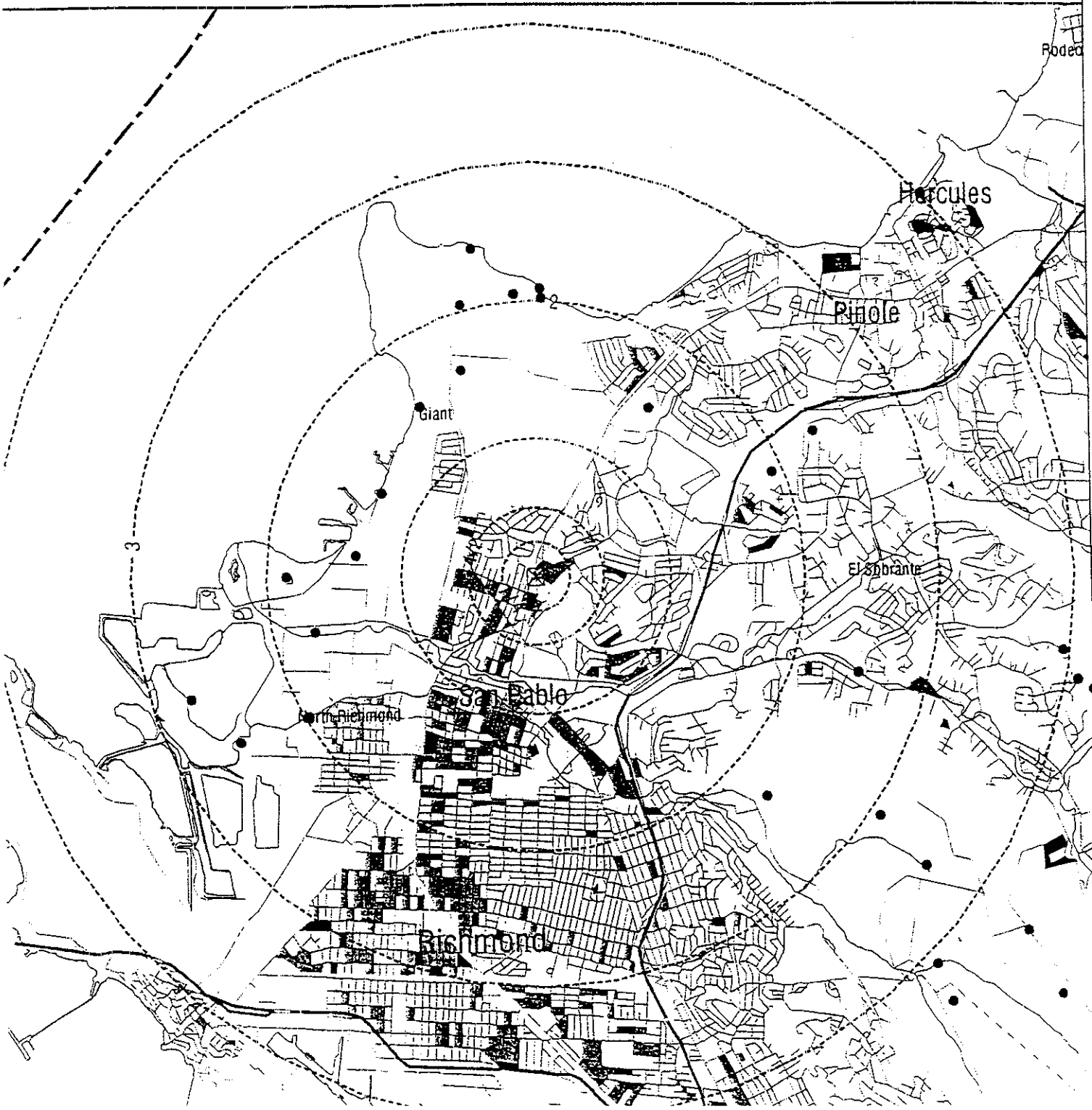
Threatened and Endangered Species

Population Density per Square Mile by Census Block

- 0
- < 1000
- 1001-5000
- 5001-15,000
- 15,001-30,000
- > 30,000



NOTE: Radius in Miles.



SITE REPORT FOR STATE OF CALIFORNIA
eptember 16, 1999

Site Name: CUROCO CORPORATION CASFN0905554'

RICHMOND, CA 94801
Latitude: 37 58 27 Longitude: 122 20 29 55

Sources:

Population Density: PL94-171, US Bureau of the Census (1990 Census)
Endangered Species: Natural Diversity Database, California Dept. of Fish & Game 1998
Drinking Water Supply Wells: Water Quality Monitoring Database, California Dept. of Health Services, 1998

****

SITE POPULATION SUMMARY:
****

RADIUS DISTANCE FROM SOURCE	POPULATION WITHIN RADIUS
1/4 Mile	2223
1/2 Mile	7171
1 Mile	19751
2 Mile	56326
3 Mile	103148
4 Mile	147521
5 Mile	179327
10 Mile	421681
15 Mile	1320133

****
DRINKING WATER WELLS:

****

WELL NO WELL NAME OWNER-USER LATITUDE LONGITUDE POPULATION SERVED
WATER SOURCE WELL TYPE WELL STATUS

1/4 Mile Radius from Site

1/4 to 1/2 Mile Radius from Site

1/2 to 1 Mile Radius from Site

---

1 to 2 Mile Radius from Site

---

2 to 3 Mile Radius from Site

---

3 to 4 Mile Radius from Site

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4 to 5 Mile Radius from Site

---

5 to 10 Mile Radius from Site

0110005013,SAN PABLO WTP - SAN PABLO RES - TREATED,EAST BAY MUD,375410 1221707
- Surface Water 1300000, RESVR/AMBNT/MUN/INAKE,ACTIVE TREATED
2110302002,WELL 06,CSP Angel Island St Park,375203 1222553
- Groundwater 1300, WELL/AMBNT/MUN/INTAKE,ACTIVE RAW
2110302001,WELL 01,CSP Angel Island St Park,375202 1222553
- Groundwater 1300, WELL/AMBNT/MUN/INTAKE,ACTIVE RAW
2110302003,WELL 03,CSP Angel Island St Park,375200 1222530
- Groundwater 1300, WELL/AMBNT,ACTIVE RAW
0105013001,SPRING 02,EBRPD - REDWOOD SPRING REGIONAL PARK,375226 1221602
- Groundwater 45, SPRING/AMBNT,ACTIVE RAW
2110302005,WELL 07,CSP Angel Island St Park,375150 1222600
- Groundwater 1300, WELL/AMBNT,ACTIVE RAW
2110302004,WELL 04,CSP Angel Island St Park,375150 1222600
- Groundwater 1300, WELL/AMBNT,ACTIVE RAW

10 to 15 Mile Radius from Site

4800572001,WELL 01,Trailer City,380625 1221239
- Groundwater 100, WELL/AMBNT/MUN/INTAKE,ACTIVE RAW
2110301001,ALICE EASTWOOD CREEK DIVERSION-ABANDONED,CSP Mt Tamalpais St Park,375436 1223454
- Surface Water 2000, STREAM/AMBNT/MUN/INTAKE,ABANDONED
2110301003,FRANK'S VALLEY WELL - ABANDONED,CSP Mt Tamalpais St Park,375254 1223422
- Groundwater 2000, WELL/AMBNT/MUN/INTAKE,ABANDONED
2100508001,WELL 01,MUIR BEACH COMMUNITY SERVICES DISTRICT,375205 1223445
- Groundwater 0, WELL/AMBNT/MUN/INTAKE,ACTIVE RAW
0707620001,WELL 01,CANYON SCHOOL,374936 1220945
- Groundwater 0, WELL/AMBNT/MUN/INTAKE,ACTIVE RAW

****

ENDANGERED SPECIES:

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INDEX # SCIENTIFIC NAME COMMON NAME LAST OBSERVATION USESA

1/4 Mile Radius from Site

1/4 to 1/2 Mile Radius from Site

1/2 to 1 Mile Radius from Site

---

1 to 2 Mile Radius from Site

147,MICROTUS CALIFORNICUS SANPABLOENSIS, SAN PABLO VOLE, 198603XX, None
151,MICROTUS CALIFORNICUS SANPABLOENSIS, SAN PABLO VOLE, 19860323, None
152,SOREX VAGRANS HALICOETES, SALT-MARSH WANDERING SHREW, 1986XXXX, Species of concern
153,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 198603XX, Endangered
154,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19860226, Species of concern
155,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 1975XXXX, Endangered
156,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 1983XXXX, Proposed Threatened
159,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 19930723, Proposed Threatened
160,MICROTUS CALIFORNICUS SANPABLOENSIS, SAN PABLO VOLE, 19370117, None
161,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19790720, Endangered
162,MICROTUS CALIFORNICUS SANPABLOENSIS, SAN PABLO VOLE, 198603XX, None
167,SOREX VAGRANS HALICOETES, SALT-MARSH WANDERING SHREW, 1985XXXX, Species of concern
168,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19790126, Endangered
169,MICROTUS CALIFORNICUS SANPABLOENSIS, SAN PABLO VOLE, 198603XX, None
170,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 198511XX, None
171,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 1986XXXX, Endangered
179,MICROTUS CALIFORNICUS SANPABLOENSIS, SAN PABLO VOLE, 198603XX, None
197,MICROTUS CALIFORNICUS SANPABLOENSIS, SAN PABLO VOLE, 198603XX, None

2 to 3 Mile Radius from Site

138,CORDYLANTHUS MOLLIS SSP MOLLIS, 'SOFT BIRD"S-BEAK', 19930707, Endangered
141,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 197706XX, None
143,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19910614, Species of concern
144,CORDYLANTHUS MOLLIS SSP MOLLIS, 'SOFT BIRD"S-BEAK', 19930707, Endangered
145,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 19980104, None
157,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 1982XXXX, Proposed Threatened
185,HELMINTHOGLYPTA NICKLINIANA BRIDGESI, 'BRIDGES" COAST RANGE SHOULDERBAND (SNAIL)', XXXXXXXX, Species of concern
188,CIRCUS CYANEUS (NESTING), NORTHERN HARRIER, 19860807, None

189,MICROTUS CALIFORNICUS SANPABLOENSIS, SAN PABLO VOLE, 198603XX, None
90,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 1985XXXX, None
191,ASIO FLAMMEUS (NESTING), SHORT-EARED OWL, 19860306, None
192,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19860305, Species of concern
193,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 198603XX, Endangered
194,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19860305, Endangered
204,ELANUS LEUCURUS (NESTING), WHITE-TAILED KITE, 19860603, None
212,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 1997XXXX, Proposed Threatened

3 to 4 Mile Radius from Site

182,ARCTOSTAPHYLOS PALLIDA, PALLID MANZANITA, 198XXXXX, Threatened
215,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 1997XXXX, Proposed Threatened
218,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 1997XXXX, Proposed Threatened

4 to 5 Mile Radius from Site

129,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 197706XX, None
130,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19770714, Species of concern
181,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 19960922, Proposed Threatened
186,NORTHERN MARITIME CHAPARRAL, NORTHERN MARITIME CHAPARRAL, 1986XXXX, None
187,ARCTOSTAPHYLOS PALLIDA, PALLID MANZANITA, 19910113, Threatened
235,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 1997XXXX, Proposed Threatened
240,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 1997XXXX, Proposed Threatened
246,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 1997XXXX, Proposed Threatened
250,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 1997XXXX, Proposed Threatened
274,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 19850112, None
277,FRITILLARIA LILIACEA, FRAGRANT FRITILLARY, 19000324, Species of concern
279,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 19980113, None
288,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 198511XX, None
289,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19940506, Endangered

5 to 10 Mile Radius from Site

76,SOREX ORNATUS SINUOSUS, SUISUN SHREW, 19870925, Species of concern
81,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 19980313, None
82,FRITILLARIA LILIACEA, FRAGRANT FRITILLARY, 18750310, Species of concern
83,PANDION HALIAETUS (NESTING), OSPREY, 19900709, None
85,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 1992XXXX, Endangered
86,LILAEOPSIS MASONII, 'MASON"S LILAEOPSIS', 19950619, Species of concern
87,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 19971220, None
88,SENECIO APHANACTIS, RAYLESS RAGWORT, 1874XXXX, None
92,ARDEA HERODIAS, GREAT BLUE HERON, 1994XXXX, None
93,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19960411, Endangered
94,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 198511XX, None
95,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19960322, Species of concern
97,LILAEOPSIS MASONII, 'MASON"S LILAEOPSIS', 19950619, Species of concern

98,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19920330, Species of concern
108,LATHYRUS JEPSONII VAR JEPSONII, DELTA TULE PEA, 19370702, Species of concern
109,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19930503, Species of concern
110,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 198606XX, Endangered
111,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19860612, Species of concern
112,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 198511XX, None
113,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 198606XX, Endangered
115,DIRCA OCCIDENTALIS, WESTERN LEATHERWOOD, 19910512, None
117,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19910512, Species of concern
118,MONARDELLA VILLOSA SSP GLOBOSA, ROBUST MONARDELLA, 190307XX, None
121,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19891114, Endangered
122,CORDYLANTHUS MARITIMUS SSP PALUSTRIS, 'POINT REYES BIRD"S-BEAK', 1990XXXX, Species of concern
133,ARDEA HERODIAS, GREAT BLUE HERON, 1982XXXX, None
134,LASTHENIA CONJUGENS, CONTRA COSTA GOLDFIELDS, 19950415, Endangered
140,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 1991XXXX, None
146,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 199009XX, None
163,CORDYLANTHUS MARITIMUS SSP PALUSTRIS, 'POINT REYES BIRD"S-BEAK', 1863XXXX, Species of concern
164,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 1975XXXX, Endangered
165,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19930720, Species of concern
173,EGRETTA THULA, SNOWY EGRET, 1982XXXX, None
174,NYCTICORAX NYCTICORAX, BLACK-CROWNED NIGHT HERON, 1982XXXX, None
175,ARDEA ALBA, GREAT EGRET, 1982XXXX, None
177,MASTICOPHIS LATERALIS EURYXANTHUS, ALAMEDA WHIPSNAKE, 19891019, Threatened
178,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19951020, Endangered
180,RANA AURORA DRAYTONII, CALIFORNIA RED-LEGGED FROG, 19940903, Threatened
195,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19870625, Endangered
196,PENTACHAETA BELLIDIFLORA, WHITE-RAYED PENTACHAETA, 19460525, Endangered
207,PENTACHAETA BELLIDIFLORA, WHITE-RAYED PENTACHAETA, 1991XXXX, Endangered
211,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19881105, Endangered
214,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 1975XXXX, Endangered
216,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 197107XX, Endangered
217,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 1986XXXX, Proposed Threatened
228,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19891113, Endangered
229,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19900613, Endangered
230,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 19870625, None
231,PHALACROCORAX AURITUS (ROOKERY SITE), DOUBLE-CRESTED CORMORANT, 1993XXXX, None
239,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19931030, Species of concern
243,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19900518, Endangered
244,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19870315, Endangered
247,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19380306, Endangered
251,TRIFOLIUM AMOENUM, SHOWY INDIAN CLOVER, XXXXXXXX, Endangered
252,HESPEROLINON CONGESTUM, MARIN WESTERN FLAX, 19860521, Threatened
258,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 1996XXXX, Proposed Threatened
262,CASTILLEJA AFFINIS SSP NEGLECTA, TIBURON INDIAN PAINTBRUSH, 19980602, Endangered
264,CLEMMYS MARMORATA, WESTERN POND TURTLE, 19920711, Species of concern

68,SERPENTINE BUNCHGRASS, SERPENTINE BUNCHGRASS, 1986XXXX, None
69,CALOCHORTUS TIBURONENSIS, TIBURON MARIPOSA LILY, 19980602, Threatened
271,COASTAL TERRACE PRAIRIE, COASTAL TERRACE PRAIRIE, 1975XXXX, None
272,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 1996XXXX, Proposed Threatened
273,HESPEROLINON CONGESTUM, MARIN WESTERN FLAX, 19980602, Threatened
275,MICROCINA TIBURONA, TIBURON MICRO-BLIND HARVESTMAN, 198411XX, Species of concern
280,NORTHERN MARITIME CHAPARRAL, NORTHERN MARITIME CHAPARRAL, 19920404, None
281,MASTICOPHIS LATERALIS EURYXANTHUS, ALAMEDA WHIPSNAKE, 19890625, Threatened
282,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19910113, Species of concern
283,ARCHOPLITES INTERRUPTUS, SACRAMENTO PERCH, 1980XXXX, Species of concern
284,CLEMMYS MARMORATA, WESTERN POND TURTLE, XXXXXXXX, Species of concern
285,HESPEROLINON CONGESTUM, MARIN WESTERN FLAX, 198XXXXX, Threatened
286,HELMINTHOGLYPTA NICKLINIANA BRIDGESI, 'BRIDGES" COAST RANGE SHOULDERBAND (SNAIL)', XXXXXXXX, Species of concern
290,DIRCA OCCIDENTALIS, WESTERN LEATHERWOOD, 19950502, None
292,SUAEDA CALIFORNICA, CALIFORNIA SEABLITE, 19120817, Endangered
293,STERNA CASPIA (NESTING COLONY), CASPIAN TERN, 19900630, None
294,CLEMMYS MARMORATA, WESTERN POND TURTLE, XXXXXXXX, Species of concern
295,STREPTANTHUS NIGER, TIBURON JEWEL-FLOWER, 19970530, Endangered
298,EGRETTA THULA, SNOWY EGRET, 19900615, None
299,DIRCA OCCIDENTALIS, WESTERN LEATHERWOOD, 19880304, None
300,NYCTICORAX NYCTICORAX, BLACK-CROWNED NIGHT HERON, 19900615, None
301,ELANUS LEUCURUS (NESTING), WHITE-TAILED KITE, 19900615, None
302,VALLEY NEEDLEGRASS GRASSLAND, VALLEY NEEDLEGRASS GRASSLAND, 197501XX, None
303,HESPEROLINON CONGESTUM, MARIN WESTERN FLAX, 19900616, Threatened
304,CASTILLEJA AFFINIS SSP NEGLECTA, TIBURON INDIAN PAINTBRUSH, 19970423, Endangered
305,SERPENTINE BUNCHGRASS, SERPENTINE BUNCHGRASS, 19860530, None
308,MICROCINA TIBURONA, TIBURON MICRO-BLIND HARVESTMAN, 19660122, Species of concern
309,DIRCA OCCIDENTALIS, WESTERN LEATHERWOOD, 19930401, None
313,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19930401, Species of concern
314,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 19980104, None
315,DIPODOMYS HEERMANNI BERKELEYENIS, BERKELEY KANGAROO RAT, 19221022, Species of concern
316,ARCHOPLITES INTERRUPTUS, SACRAMENTO PERCH, 19800517, Species of concern
319,HESPEROLINON CONGESTUM, MARIN WESTERN FLAX, 19860521, Threatened
322,HELMINTHOGLYPTA NICKLINIANA BRIDGESI, 'BRIDGES" COAST RANGE SHOULDERBAND (SNAIL)', XXXXXXXX, Species of concern
323,ARCTOSTAPHYLOS PALLIDA, PALLID MANZANITA, 198XXXXX, Threatened
325,CASTILLEJA AFFINIS SSP NEGLECTA, TIBURON INDIAN PAINTBRUSH, 1996XXXX, Endangered
326,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19931030, Species of concern
327,ARCTOSTAPHYLOS PALLIDA, PALLID MANZANITA, 198308XX, Threatened
328,STREPTANTHUS NIGER, TIBURON JEWEL-FLOWER, 19980602, Endangered
329,DIRCA OCCIDENTALIS, WESTERN LEATHERWOOD, 19910226, None
330,SERPENTINE BUNCHGRASS, SERPENTINE BUNCHGRASS, 19890626, None
331,RANA AURORA DRAYTONII, CALIFORNIA RED-LEGGED FROG, 19970301, Threatened
332,MASTICOPHIS LATERALIS EURYXANTHUS, ALAMEDA WHIPSNAKE, 1991XXXX, Threatened
333,FRITILLARIA LILIACEA, FRAGRANT FRITILLARY, 19380308, Species of concern
334,HESPEROLINON CONGESTUM, MARIN WESTERN FLAX, 19980602, Threatened
335,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 19980109, None
336,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19910426, Species of concern

337,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 1973XXXX, Species of concern
38,DIRCA OCCIDENTALIS, WESTERN LEATHERWOOD, 19400208, None
339,MASTICOPHIS LATERALIS EURYXANTHUS, ALAMEDA WHIPSNAKE, 19960502, Threatened
341,HELMINTHOGLYPTA NICKLINIANA BRIDGESI, 'BRIDGES" COAST RANGE SHOULDERBAND (SNAIL)', XXXXXXXX, Species of concern
342,DIPODOMYS HEERMANNI BERKELEYENIS, BERKELEY KANGAROO RAT, XXXXXXXX, Species of concern
345,DIRCA OCCIDENTALIS, WESTERN LEATHERWOOD, 19910307, None
347,MASTICOPHIS LATERALIS EURYXANTHUS, ALAMEDA WHIPSNAKE, 19480426, Threatened
349,MONARDELLA VILLOSA SSP GLOBOSA, ROBUST MONARDELLA, 19430710, None
350,DIRCA OCCIDENTALIS, WESTERN LEATHERWOOD, 19560415, None
351,MASTICOPHIS LATERALIS EURYXANTHUS, ALAMEDA WHIPSNAKE, 19900603, Threatened
352,DIRCA OCCIDENTALIS, WESTERN LEATHERWOOD, 19910227, None
355,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 199011XX, None
356,DIPODOMYS HEERMANNI BERKELEYENIS, BERKELEY KANGAROO RAT, 19181006, Species of concern
357,MASTICOPHIS LATERALIS EURYXANTHUS, ALAMEDA WHIPSNAKE, 19401110, Threatened
358,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 199011XX, None
360,EUCYCLOGOBIUS NEWBERRYI, TIDEWATER GOBY, 1984XXXX, Endangered
364,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 19160626, Proposed Threatened
365,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19220823, Species of concern

10 to 15 Mile Radius from Site

1,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, Species of concern
2,LATHYRUS JEPSONII VAR JEPSONII, DELTA TULE PEA, 1980XXXX, Species of concern
3,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 1975XXXX, Endangered
4,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 1975XXXX, Endangered
5,CHARADRIUS ALEXANDRINUS NIVOSUS (NESTING), WESTERN SNOWY PLOVER, 1978XXXX, Threatened
6,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, XXXXXXXX, Species of concern
7,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, Species of concern
8,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, Species of concern
9,ATHENE CUNICULARIA (BURROW SITES), BURROWING OWL, 19881022, Species of concern
10,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 1975XXXX, Endangered
11,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, Species of concern
12,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 1985XXXX, Endangered
13,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19770503, Species of concern
14,ANTROZOUS PALLIDUS, PALLID BAT, 19900828, None
15,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 19860923, None
16,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, Species of concern
17,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX,

Species of concern
8,SOREX ORNATUS SINUOSUS, SUISUN SHREW, 19520325, Species of concern
19,ASTRAGALUS TENER VAR TENER, ALKALI MILK-VETCH, 19930418, None
20,ATRIPLEX JOAQUINIANA, SAN JOAQUIN SALTBUSH, 19910914, Species of concern
21,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19770427, Species of concern
22,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, Species of concern
23,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19820821, Endangered
24,BALSAMORHIZA MACROLEPIS VAR MACROLEPIS, BIG-SCALE BALSAMROOT, 19880411, None
25,LATHYRUS JEPSONII VAR JEPSONII, DELTA TULE PEA, 19830606, Species of concern
26,RANA AURORA DRAYTONII, CALIFORNIA RED-LEGGED FROG, 19970419, Threatened
27,AGELAIUS TRICOLOR (NESTING COLONY), TRICOLORED BLACKBIRD, 19970419, Species of concern
28,ATHENE CUNICULARIA (BURROW SITES), BURROWING OWL, 19891203, Species of concern
29,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19890920, Endangered
30,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 1975XXXX, Endangered
31,SOREX ORNATUS SINUOSUS, SUISUN SHREW, 19830625, Species of concern
32,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19830625, Endangered
33,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19770502, Species of concern
34,AQUILA CHRYSAETOS (NESTING AND WINTERING), GOLDEN EAGLE, 19910319, None
35,CORDYLANTHUS MOLLIS SSP MOLLIS, 'SOFT BIRD"S-BEAK', 19930914, Endangered
36,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19770629, Species of concern
37,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, Species of concern
38,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19900109, Endangered
39,STERNA CASPIA (NESTING COLONY), CASPIAN TERN, 19900610, None
40,ATHENE CUNICULARIA (BURROW SITES), BURROWING OWL, 1987XXXX, Species of concern
41,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, Species of concern
42,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, Species of concern
43,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19900625, Endangered
44,ATHENE CUNICULARIA (BURROW SITES), BURROWING OWL, 198412XX, Species of concern
45,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 197706XX, None
46,POGONICHTHYS MACROLEPIDOTUS, SACRAMENTO SPLITTAIL, 19950710, Proposed Threatened
47,SOREX ORNATUS SINUOSUS, SUISUN SHREW, 19501109, Species of concern
48,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, Species of concern
49,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19770328, Species of concern
50,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 1975XXXX, Endangered
51,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19821011, Endangered
52,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 197706XX, None
53,SOREX ORNATUS SINUOSUS, SUISUN SHREW, 19730406, Species of concern
54,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19900102, Endangered
55,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19920331, Endangered
56,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19820917, Endangered

57,AGELAIUS TRICOLOR (NESTING COLONY), TRICOLORED BLACKBIRD, 19880531, Species of ncern
58,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 1975XXXX, Endangered
59,AGELAIUS TRICOLOR (NESTING COLONY), TRICOLORED BLACKBIRD, 19880531, Species of concern
60,LILAEOPSIS MASONII, 'MASON"S LILAEOPSIS', 19950710, Species of concern
61,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19930623, Species of concern
62,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19900625, Endangered
63,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, Species of concern
64,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19770226, Species of concern
65,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, Species of concern
66,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 19950619, Species of concern
67,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 1985XXXX, Endangered
68,SOREX ORNATUS SINUOSUS, SUISUN SHREW, 19750609, Species of concern
69,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19920427, Endangered
70,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 197706XX, None
71,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, pecies of concern
72,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19920427, Endangered
73,LILAEOPSIS MASONII, 'MASON"S LILAEOPSIS', 19950823, Species of concern
74,CORDYLANTHUS MOLLIS SSP MOLLIS, 'SOFT BIRD"S-BEAK', 19940906, Endangered
75,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19860612, Species of concern
77,EUCYCLOGOBIUS NEWBERRYI, TIDEWATER GOBY, 1984XXXX, Endangered
78,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19930629, Endangered
79,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 197706XX, None
80,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19930629, Species of concern
84,AGELAIUS TRICOLOR (NESTING COLONY), TRICOLORED BLACKBIRD, 198705XX, Species of concern
89,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19900404, Endangered
90,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 1985XXXX, Endangered
91,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19871222, Species of concern
96,SOREX ORNATUS SINUOSUS, SUISUN SHREW, 19830621, Species of concern
99,STREPTANTHUS GLANDULOSUS SSP PULCHELLUS, MT TAMALPAIS JEWEL-FLOWER, 19450505, None
100,ASTER LENTUS, SUISUN MARSH ASTER, 1986XXXX, Species of concern
101,MELOSPIZA MELODIA MAXILLARIS, SUISUN SONG SPARROW, 1986XXXX, Species of concern
102,LATHYRUS JEPSONII VAR JEPSONII, DELTA TULE PEA, 1986XXXX, Species of concern
103,CORDYLANTHUS MOLLIS SSP MOLLIS, 'SOFT BIRD"S-BEAK', 19930706, Endangered
104,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19901203, Species of concern
105,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19930906, Endangered
106,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 197706XX, None

107,HEMIZONIA PARRYI SSP CONGDONII, CONGDON"S TARPLANT 19301017, Species of concern
4,ATHENE CUNICULARIA (BURROW SITES), BURROWING OWL, 19840206, Species of concern
116,MELOSPIZA MELODIA MAXILLARIS, SUISUN SONG SPARROW, 1986XXXX, Species of concern
119,LILAEOPSIS MASONII, 'MASON"S LILAEOPSIS', 199206XX, Species of concern
120,COASTAL BRACKISH MARSH, COASTAL BRACKISH MARSH, 197706XX, None
123,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19581115, Endangered
124,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19900503, Species of concern
125,CORDYLANTHUS MOLLIS SSP MOLLIS, 'SOFT BIRD"S-BEAK', 19930818, Endangered
126,LATHYRUS JEPSONII VAR JEPSONII, DELTA TULE PEA, 1974XXXX, Species of concern
127,CALOCHORTUS PULCHELLUS, MT. DIABLO FAIRY-LANTERN, 19920514, None
128,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 197706XX, None
131,CALOCHORTUS PULCHELLUS, MT. DIABLO FAIRY-LANTERN, 19920514, None
132,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19900519, Species of concern
135,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19900420, Endangered
136,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19900519, Species of concern
137,AGELAIUS TRICOLOR (NESTING COLONY), TRICOLORED BLACKBIRD, 19800419, Species of concern
139,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19890818, Endangered
142,MONARDELLA VILLOSA SSP GLOBOSA, ROBUST MONARDELLA, XXXXXXXX, None
148,SIDALCEA CALYCOSA SSP RHIZOMATA, POINT REYES CHECKERBLOOM, 192204XX, None
149,LESSINGIA MICRADENIA VAR MICRADENIA, TAMALPAIS LESSINGIA, 19380522, Species of concern
150,STREPTANTHUS GLANDULOSUS SSP PULCHELLUS, MT. TAMALPAIS JEWEL-FLOWER, 19860602, None
158,STREPTANTHUS GLANDULOSUS SSP PULCHELLUS, MT. TAMALPAIS JEWEL-FLOWER, 19460612, None
166,HEMIZONIA PARRYI SSP CONGDONII, 'CONGDON"S TARPLANT', 19161014, Species of concern
172,AMBYSTOMA CALIFORNIENSE, CALIFORNIA TIGER SALAMANDER, 192005XX, Candidate
176,PLEUROPOGON HOOVERIANUS, NORTH COAST SEMAPHORE GRASS, 19880516, Species of concern
183,LESSINGIA MICRADENIA VAR MICRADENIA, TAMALPAIS LESSINGIA, 19600829, Species of concern
184,CLEMMYS MARMORATA MARMORATA, NORTHWESTERN POND TURTLE, XXXXXXXX, Species of concern
198,PLEUROPOGON HOOVERIANUS, NORTH COAST SEMAPHORE GRASS, 1990XXXX, Species of concern
199,SIDALCEA CALYCOSA SSP RHIZOMATA, POINT REYES CHECKERBLOOM, 19180511, None
200,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 1931XXXX, Endangered
201,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19590829, Endangered
202,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19320208, Species of concern
203,ARCTOSTAPHYLOS HOOKERI SSP MONTANA, MT. TAMALPAIS MANZANITA, 19180315, Species of concern
205,CIRSIUM HYDROPHILUM VAR VASEYI, MT. TAMALPAIS THISTLE, 19870718, Species of concern
206,EUCYCLOGOBIUS NEWBERRYI, TIDEWATER GOBY, 1984XXXX, Endangered
208,NAVARRETIA ROSULATA, MARIN COUNTY NAVARRETIA, 1990XXXX, None
209,PENTACHAETA BELLIDIFLORA, WHITE-RAYED PENTACHAETA, 19360411, Endangered
210,POLYGONUM MARINENSE, MARIN KNOTWEED, 19870615, Species of concern
213,STRIX OCCIDENTALIS CAURINA, NORTHERN SPOTTED OWL, 1983XXXX, Threatened

219,STREPTANTHUS BATRACHOPUS, TAMALPAIS JEWEL-FLOWER, 19940517, Species of concern
220,STREPTANTHUS BATRACHOPUS, TAMALPAIS JEWEL-FLOWER, 199009XX, Species of concern
221,HORKELIA TENUILOBA, THIN-LOBED HORKELIA, 19350718, None
222,ARCTOSTAPHYLOS HOOKERI SSP MONTANA, MT. TAMALPAIS MANZANITA, 19470420, Species of concern
223,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19900712, Species of concern
224,CALOCHORTUS PULCHELLUS, MT. DIABLO FAIRY-LANTERN, 19820612, None
225,STREPTANTHUS GLANDULOSUS SSP PULCHELLUS, MT. TAMALPAIS JEWEL-FLOWER, 19380613, None
226,CHORIZANTHE CUSPIDATA VAR CUSPIDATA, SAN FRANCISCO BAY SPINEFLOWER, 18700708, Species of concern
227,PENTACHAETA BELLIDIFLORA, WHITE-RAYED PENTACHAETA, 19690412, Endangered
232,ARCTOSTAPHYLOS HOOKERI SSP MONTANA, MT. TAMALPAIS MANZANITA, 19850606, Species of concern
233,STREPTANTHUS GLANDULOSUS SSP PULCHELLUS, MT. TAMALPAIS JEWEL-FLOWER, 19850606, None
234,RANA AURORA DRAYTONII, CALIFORNIA RED-LEGGED FROG, 19951106, Threatened
236,STREPTANTHUS GLANDULOSUS SSP PULCHELLUS, MT. TAMALPAIS JEWEL-FLOWER, 19850606, None
237,RANA AURORA DRAYTONII, CALIFORNIA RED-LEGGED FROG, 19951201, Threatened
238,CALOCHORTUS PULCHELLUS, MT. DIABLO FAIRY-LANTERN, 19920503, None
241,CALOCHORTUS PULCHELLUS, MT. DIABLO FAIRY-LANTERN, 19900429, None
242,ARCTOSTAPHYLOS HOOKERI SSP MONTANA, MT. TAMALPAIS MANZANITA, 19591028, Species of concern
245,HORKELIA TENUILOBA, THIN-LOBED HORKELIA, 19950516, None
248,ARCTOSTAPHYLOS HOOKERI SSP MONTANA, MT. TAMALPAIS MANZANITA, 19160709, Species of concern
249,BOSCHNIAKIA HOOKERI, SMALL GROUNDCONE, 19580518, None
253,HORKELIA TENUILOBA, THIN-LOBED HORKELIA, 19950530, None
254,CIRSIUM HYDROPHILUM VAR VASEYI, MT. TAMALPAIS THISTLE, 19870609, Species of concern
255,CIRSIUM HYDROPHILUM VAR VASEYI, MT. TAMALPAIS THISTLE, 19870516, Species of concern
256,STREPTANTHUS GLANDULOSUS SSP PULCHELLUS, MT. TAMALPAIS JEWEL-FLOWER, 19870617, None
257,BOSCHNIAKIA HOOKERI, SMALL GROUNDCONE, 19440618, None
259,ARCTOSTAPHYLOS HOOKERI SSP MONTANA, MT. TAMALPAIS MANZANITA, 19830320, Species of concern
260,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19901202, Species of concern
261,CIRSIUM HYDROPHILUM VAR VASEYI, MT. TAMALPAIS THISTLE, 19870516, Species of concern
263,ARCTOSTAPHYLOS HOOKERI SSP MONTANA, MT. TAMALPAIS MANZANITA, 192603XX, Species of concern
265,ARCTOSTAPHYLOS VIRGATA, MARIN MANZANITA, 1983XXXX, None
266,STREPTANTHUS GLANDULOSUS SSP PULCHELLUS, MT. TAMALPAIS JEWEL-FLOWER, 19470601, None
267,ARCTOSTAPHYLOS HOOKERI SSP MONTANA, MT. TAMALPAIS MANZANITA, 19640408, Species of concern
270,ARCTOSTAPHYLOS HOOKERI SSP MONTANA, MT. TAMALPAIS MANZANITA, 19310213, Species of concern
276,BOSCHNIAKIA HOOKERI, SMALL GROUNDCONE, XXXXXXXX, None
278,STRIX OCCIDENTALIS CAURINA, NORTHERN SPOTTED OWL, 19840811, Threatened
287,ARCTOSTAPHYLOS VIRGATA, MARIN MANZANITA, 19220312, None

291,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19900701, Species of concern
)6,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19880428, Species of concern
297,CALOCHORTUS PULCHELLUS, MT DIABLO FAIRY-LANTERN, 19700418, None
306,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 19XX0625, None
307,HELIANTHELLA CASTANEA, DIABLO HELIANTHELLA, 19900701, Species of concern
310,ARDEA HERODIAS, GREAT BLUE HERON, 1982XXXX, None
311,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 1967XXXX, Endangered
312,CORDYLANTHUS MARITIMUS SSP PALUSTRIS, 'POINT REYES BIRD"S-BEAK', 1990XXXX, Species of concern
317,COASTAL BRACKISH MARSH, COASTAL BRACKISH MARSH, 19870625, None
318,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 19380306, Endangered
320,PLAGIOBOTHRYS GLABER, HAIRLESS POPCORN-FLOWER, 19240427, None
321,LATERALLUS JAMAICENSIS COTURNICULUS, CALIFORNIA BLACK RAIL, 19290811, Species of concern
324,CORDYLANTHUS MARITIMUS SSP PALUSTRIS, 'POINT REYES BIRD"S-BEAK', 1990XXXX, Species of concern
340,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 19960106, None
343,PENTACHAETA BELLIDIFLORA, WHITE-RAYED PENTACHAETA, XXXXXXXX, Endangered
344,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 19980103, None
346,MASTICOPHIS LATERALIS EURYXANTHUS, ALAMEDA WHIPSNAKE, 19900415, Threatened
348,CLEMMYS MARMORATA MARMORATA, NORTHWESTERN POND TURTLE, 19930429, Species of concern
353,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 199412XX, None
354,ENHYDRA LUTRIS NEREIS, SOUTHERN SEA OTTER, 199707XX, Threatened
359,RANA AURORA DRAYTONII, CALIFORNIA RED-LEGGED FROG, 19970312, Threatened
361,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, Species of concern
362,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 19980104, None
363,RANA BOYLII, FOOTHILL YELLOW-LEGGED FROG, 19970228, Species of concern
366,GEOTHLYPIS TRICHAS SINUOSA, SALTMARSH COMMON YELLOWTHROAT, 1985XXXX, Species of concern
367,AQUILA CHRYSAETOS (NESTING AND WINTERING), GOLDEN EAGLE, 19930523, None
368,CLEMMYS MARMORATA, WESTERN POND TURTLE, XXXXXXXX, Species of concern
369,ICARICIA ICARIOIDES MISSIONENSIS, MISSION BLUE BUTTERFLY, 1985XXXX, Endangered
370,EUCYCLOGOBIUS NEWBERRYI, TIDEWATER GOBY, 1996XXXX, Endangered
371,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 19980104, None
372,MASTICOPHIS LATERALIS EURYXANTHUS, ALAMEDA WHIPSNAKE, 19900703, Threatened
373,RANA AURORA DRAYTONII, CALIFORNIA RED-LEGGED FROG, 194XXXXX, Threatened
374,NORTHERN MARITIME CHAPARRAL, NORTHERN MARITIME CHAPARRAL, 19910216, None
375,DIRCA OCCIDENTALIS, WESTERN LEATHERWOOD, 19920308, None
376,ARCTOSTAPHYLOS PALLIDA, PALLID MANZANITA, 19910216, Threatened
377,RALLUS LONGIROSTRIS OBSOLETUS, CALIFORNIA CLAPPER RAIL, 19891212, Endangered
378,NORTHERN COASTAL SALT MARSH, NORTHERN COASTAL SALT MARSH, 197706XX, None
379,REITHRODONTOMYS RAVIVENTRIS, SALT-MARSH HARVEST MOUSE, 198606XX, Endangered
380,ASTRAGALUS TENER VAR TENER, ALKALI MILK-VETCH, 18820508, None
381,HOLOCARPHA MACRADENIA, SANTA CRUZ TARPLANT, 1976XXXX, Proposed Threatened
382,ARCTOSTAPHYLOS PALLIDA, PALLID MANZANITA, 1985XXXX, Threatened
383,ARCTOSTAPHYLOS PALLIDA, PALLID MANZANITA, 1985XXXX, Threatened
384,ARCTOSTAPHYLOS PALLIDA, PALLID MANZANITA, 1985XXXX, Threatened
385,DIRCA OCCIDENTALIS, WESTERN LEATHERWOOD, 19930228, None

386,ARENARIA PALUDICOLA, MARSH SANDWORT, 18990729, Endangered
387,ARCTOSTAPHYLOS PALLIDA, PALLID MANZANITA, 198XXXXX, Threatened
388,DIRCA OCCIDENTALIS, WESTERN LEATHERWOOD, 19880213, None
389,ARCTOSTAPHYLOS PALLIDA, PALLID MANZANITA, 19890325, Threatened
390,PHALACROCORAX AURITUS (ROOKERY SITE), DOUBLE-CRESTED CORMORANT, 1988XXXX, None
391,ASTRAGALUS TENER VAR TENER, ALKALI MILK-VETCH, 18880426, None
392,ARCTOSTAPHYLOS HOOKERI SSP RAVENII, PRESIDIO MANZANITA, 19871123, Endangered
393,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 19960106, None
394,GRINDELIA HIRSUTULA VAR MARITIMA, SAN FRANCISCO GUMPLANT, 198708XX, Species of concern
395,CHORIZANTHE CUSPIDATA VAR CUSPIDATA, SAN FRANCISCO BAY SPINEFLOWER, 1881XXXX, Species of concern
396,HORKELIA CUNEATA SSP SERICEA, 'KELLOGG"S HORKELIA', 198XXXXX, Species of concern
397,GRINDELIA HIRSUTULA VAR MARITIMA, SAN FRANCISCO GUMPLANT, 198708XX, Species of concern
398,ARCTOSTAPHYLOS PALLIDA, PALLID MANZANITA, 1985XXXX, Threatened
399,EUPHYDRYAS EDITHA BAYENSIS, BAY CHECKERSPOT BUTTERFLY, 1980XXXX, Threatened
400,CLARKIA FRANCISCANA, PRESIDIO CLARKIA, 19830618, Endangered
401,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 1860XXXX, None
402,ARCTOSTAPHYLOS PALLIDA, PALLID MANZANITA, 19890329, Threatened
403,HESPEROLINON CONGESTUM, MARIN WESTERN FLAX, 19870528, Threatened
404,GRINDELIA HIRSUTULA VAR MARITIMA, SAN FRANCISCO GUMPLANT, 198708XX, Species of concern
405,ARCTOSTAPHYLOS HOOKERI SSP RAVENII, PRESIDIO MANZANITA, 19890803, Endangered
406,TRIPHYSARIA FLORIBUNDA, 'SAN FRANCISCO OWL"S-CLOVER', 19850422, Species of concern
407,CLARKIA FRANCISCANA, PRESIDIO CLARKIA, 1996XXXX, Endangered
408,ARCTOSTAPHYLOS PALLIDA, PALLID MANZANITA, 198308XX, Threatened
409,SILENE VERECUNDA SSP VERECUNDA, SAN FRANCISCO CAMPION, 19850514, Species of concern
410,CHORIZANTHE CUSPIDATA VAR CUSPIDATA, SAN FRANCISCO BAY SPINEFLOWER, 19920622, Species of concern
411,SERPENTINE BUNCHGRASS, SERPENTINE BUNCHGRASS, 1986XXXX, None
412,CHORIZANTHE CUSPIDATA VAR CUSPIDATA, SAN FRANCISCO BAY SPINEFLOWER, 19920627, Species of concern
413,DANAUS PLEXIPPUS, MONARCH BUTTERFLY, 19980129, None
414,LESSINGIA GERMANORUM, SAN FRANCISCO LESSINGIA, 199109XX, Endangered
415,EUCYCLOGOBIUS NEWBERRYI, TIDEWATER GOBY, 19XXXXXX, Endangered
416,COLLINSIA CORYMBOSA, ROUND-HEADED CHINESE HOUSES, 19020429, None
417,ARCTOSTAPHYLOS HOOKERI SSP RAVENII, PRESIDIO MANZANITA, 19871123, Endangered
418,CLARKIA FRANCISCANA, PRESIDIO CLARKIA, 1996XXXX, Endangered
419,HESPEROLINON CONGESTUM, MARIN WESTERN FLAX, 19860528, Threatened
420,LESSINGIA GERMANORUM, SAN FRANCISCO LESSINGIA, 19920612, Endangered
421,CHORIZANTHE CUSPIDATA VAR CUSPIDATA, SAN FRANCISCO BAY SPINEFLOWER, 19920612, Species of concern
422,CLARKIA FRANCISCANA, PRESIDIO CLARKIA, 19910602, Endangered
423,CLARKIA CONCINNA SSP AUTOMIXA, SANTA CLARA RED RIBBONS, 19360522, Species of concern
424,LESSINGIA GERMANORUM, SAN FRANCISCO LESSINGIA, 1991XXXX, Endangered
425,CHORIZANTHE CUSPIDATA VAR CUSPIDATA, SAN FRANCISCO BAY SPINEFLOWER,

19920626, Species of concern
5,PLAGIOBOTHRYS DIFFUSUS, SAN FRANCISCO POPCORN-FLOWER, 19330507, Species of concern
427,LESSINGIA GERMANORUM, SAN FRANCISCO LESSINGIA, 199109XX, Endangered
428,RANA AURORA DRAYTONII, CALIFORNIA RED-LEGGED FROG, XXXXXXXX, Threatened
429,TRYONIA IMITATOR, MIMIC TRYONIA (=CALIFORNIA BRACKISHWATER SNAIL), XXXXXXXX, Species of concern
430,HESPEROLINON CONGESTUM, MARIN WESTERN FLAX, 19860518, Threatened
431,ARCTOSTAPHYLOS HOOKERI SSP FRANCISCANA, FRANCISCAN MANZANITA, 19420319, Species of concern
432,ARCTOSTAPHYLOS HOOKERI SSP RAVENII, PRESIDIO MANZANITA, 1938XXXX, Endangered
433,HESPEROLINON CONGESTUM, MARIN WESTERN FLAX, 19860518, Threatened
434,CHORIZANTHE CUSPIDATA VAR CUSPIDATA, SAN FRANCISCO BAY SPINEFLOWER, 19120606, Species of concern
435,LESSINGIA GERMANORUM, SAN FRANCISCO LESSINGIA, XXXXXXXX, Endangered
436,STERNA ANTILLARUM BROWNI (NESTING COLONY), CALIFORNIA LEAST TERN, 1996XXXX, Endangered
437,ARCTOSTAPHYLOS HOOKERI SSP RAVENII, PRESIDIO MANZANITA, 19281203, Endangered
438,ARCTOSTAPHYLOS HOOKERI SSP FRANCISCANA, FRANCISCAN MANZANITA, XXXXXXXX, Species of concern
439,ARCTOSTAPHYLOS HOOKERI SSP RAVENII, PRESIDIO MANZANITA, XXXXXXXX, Endangered

APPENDIX E

CEQA DOCUMENT

NEGATIVE DECLARATION

Submitting: ☒ **Draft**
☐ **Final**
☐ **Mitigated Negative Declaration**

Project Title: Reaction Products

State Clearinghouse Number: _____

Contact Person: Bill Brown Phone # (510) 540-3841

Project Location (*Include County*):

840 Morton Avenue
Richmond, Contra Costa County, California 94806

Project Description:

The Department of Toxic Substances Control is considering the approval of a draft Removal Action Workplan (RAW), submitted by CSS Environmental Services, Inc. on behalf of Reaction Products, Inc. (RPI) pursuant to the provisions of Chapter 6.8, Division 20, California Health and Safety Code (H&SC). The RPI Site is an approximately 3-acre lot that historically and currently mixes and distributes water treatment chemical products. If approved, this RAW would authorize RPI to continue to conduct activities associated with remediation of groundwater contaminated with volatile organic compounds (VOCs) including trichloroethylene (TCE), 1,2-dichloroethane (1,2-DCA) and their breakdown products. The RAW was prepared in accordance with H&SC Section 25356.1(h).

The project is the approval of a RAW for the shallow and lower groundwater impacted with volatile organic compounds (VOCs), primarily trichloroethylene (TCE) and 1,2-dichloroethane (1,2-DCA), above state Maximum Contaminant Levels (MCLs). The proposed removal action combines injection of hydrogen releasing compounds with bio-inoculum (HRC/BIO) into the impacted groundwater. Further, three monitoring wells will be installed to assess the performance of the removal action. Groundwater sampling will be performed for a two-year period. This period will allow sufficient time to analyze the effectiveness of the HRC/BIO strategy. In the unlikely event that this enhanced natural attenuation proves to be ineffective in decreasing VOCs concentrations in groundwater to below MCLs, a contingency remedy using an effective in-situ treatment technology will be required as a separate action subject to DTSC review and approval. DTSC will conduct oversight activities to ensure that the removal action activities are implemented in accordance with the approved workplans Remediation work will take approximately 6 weeks.

Findings of Significant Effect on Environment: DTSC has determined that this project, as proposed, will not have a significant impact on the environment as that term is defined in Public Resources Code, Section 21068. The attached Initial Study prepared by the DTSC supports this finding.

Mitigation Measures: NA

DTSC Branch Chief Signature		Date
Barbara J. Cook	Branch Chief	(510) 540-3843
DTSC Branch Chief Name	DTSC Branch Chief Title	Phone #

CERTIFICATE OF EXEMPTION
FROM DEPARTMENT OF FISH & GAME FILING FEE

FINDING OF DE MINIMIS IMPACT

Project Title: Reaction Products

State Clearinghouse Number:

Contact Person: Bill Brown Phone # (510) 540-3841

Project Location (*Include County*):

840 Morton Avenue
Richmond, Contra Costa County, California 94806

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The Department of Toxic Substances Control is considering the approval of a draft Removal Action Workplan (RAW), submitted by CSS Environmental Services, Inc. on behalf of Reaction Products, Inc. (RPI) pursuant to the provisions of Chapter 6.8, Division 20, California Health and Safety Code (H&SC) The RPI Site is an approximately 3-acre lot that historically and currently mixes and distributes water treatment chemical products. If approved, this RAW would authorize RPI to continue conduct activities associated with remediation of groundwater contaminated with volatile organic compounds (VOCs) including trichloroethylene (TCE), 1,2-dichloroethane (1,2-DCA) and their breakdown products. The RAW was prepared in accordance with H&SC Section 25356.1(h).

The project is the approval of a RAW for the shallow and lower groundwater impacted with (VOCs), including TCE and 1,2-DCA, above state Maximum Contaminant Levels (MCLs). The proposed removal action combines injection of hydrogen releasing compounds with bio-inoculum (HRC/BIO) into the impacted groundwater.
Further, three monitoring wells will be installed to assess the performance of the removal action. Groundwater sampling will be performed for a two-year period. This period will allow sufficient time to analyze the effectiveness of the HRC/BIO strategy. In the unlikely event that this enhanced natural attenuation proves to be ineffective in decreasing VOCs concentrations in groundwater to below MCLs, a contingency remedy using an effective in-situ treatment technology will be required as a separate action subject to DTSC review and approval. DTSC will conduct oversight activities to ensure that the removal action activities are implemented in accordance with the approved workplans. Remediation work will take approximately 6 weeks.

Findings of Exemption:

The Department of Toxic Substances Control (DTSC) prepared an Initial Study pursuant to the California Environmental Quality Act[1] and implementing Guidelines[2] that evaluated the proposed project for the potential for adverse environmental impact. Considering the record as a whole, there is no evidence before DTSC that the proposed project will have potential for an adverse effect on wildlife resources or the habitat upon which the wildlife depend.

Findings supporting this declaration are contained in Section V. Finding of De Minimis Impact to Fish, Wildlife and Habitat of the Initial Study. This section, and any other portions of the Initial Study it references, is attached.

Certification:

DTSC certifies that the evidence contained in the record supporting the findings herein are true and accurate and declares that it has, on the basis of substantial evidence, rebutted the presumption of adverse effect contained in title 14, California

[1] Public Resources Code § 21000 et seq.
[2] Title 14, California Code of Regulations, Division 6, Chapter 3, §15000 et seq

Code of Regulations, section 753 5(c).

DTSC Branch Chief Signature		Date
Barbara J. Cook, P.E.	Branch Chief	(510) 540-3843
DTSC Branch Chief Name	DTSC Branch Chief Title	Phone #

INITIAL STUDY

The Department of Toxic Substances Control (DTSC) has completed the following Initial Study for this project in accordance with the California Environmental Quality Act (§ 21000 et seq., California Public Resources Code) and implementing Guidelines (§15000 et seq., Title 14, California Code of Regulations).

I. PROJECT INFORMATION

Project Name: Reaction Products

Site Address: 840 Morton Avenue

City: Richmond State: California Zip Code: 94806 County: Contra Costa

Company Contact Person: Mr. Dwight Merrill

Address: 840 Morton Avenue

City: Richmond State: California Zip Code: 94806 Phone Number: (510) 234-5060

Project Description:

The Reaction Products, Inc (RPI) site is located at 840 Morton Avenue in Richmond, Contra Costa County, California, and consists of approximately 3 acres in a mixed industrial/residential neighborhood. The site is bounded by Union Pacific Railroad to the west, Morton Avenue to the north, and on the east and south by the former Witco Argus Corporation property (Witco site), currently known as the Chemtura Corporation property. The regional location plan for the site is presented as Figure 1, the vicinity plan is presented as Figure 2, and the site plan is presented as Figure 3. The RPI Site historically and currently mixes and distributes water treatment chemical products. More recently, RPI mixes and distributes waterproofing resins and urethane plastics.

The Department of Toxic Substances Control is considering the approval of a draft Removal Action Workplan (RAW), submitted by CSS Environmental Services, Inc. on behalf of RPI pursuant to the provisions of Chapter 6.8, Division 20, California Health and Safety Code (H&SC). If approved, this RAW would authorize RPI to continue to conduct activities associated with remediation of groundwater contaminated with volatile organic compounds including trichloroethylene (TCE), 1,2-dichloroethane (1,2-DCA), and their breakdown products. The RAW was prepared in accordance with H&SC Section 25356.1(h).

Project Activities:

The project is the approval of a RAW for the shallow and lower groundwater impacted with volatile organic compounds (VOCs), primarily trichloroethylene (TCE) and 1,2-dichloroethane (1,2-DCA), above state Maximum Contaminant Levels (MCLs). The proposed removal action combines injection of hydrogen releasing compounds with bio-inoculum (HRC/BIO) into the impacted groundwater. Further, three monitoring wells will be installed to assess the performance of the removal action. Groundwater sampling will be performed for a two-year period. This period will allow sufficient time to analyze the effectiveness of the HRC/BIO strategy. In the unlikely event that this enhanced natural attenuation proves to be ineffective in decreasing VOCs concentrations in groundwater to below MCLs, a contingency remedy using an effective in-situ treatment technology will be required as a separate action subject to DTSC review and approval. DTSC will conduct oversight activities to ensure that the removal action activities are implemented in accordance with the approved workplans. Remediation work will take approximately 6 weeks.

II. DISCRETIONARY APPROVAL ACTION BEING CONSIDERED BY DTSC

☐ Initial Permit Issuance ☐ Closure Plan ☒ Removal Action Workplan

☐ Permit Renewal ☐ Regulations ☐ Interim Removal

☐ Permit Modification ☐ Remedial Action Plan ☐ Other (Specify)

Program/ Region Approving Project: : Northern California, Coastal Cleanup Operations Branch

DTSC Contact Person: Bill Brown

Address: 700 Heinz Avenue

City: Berkeley State: California Zip Code: 94710 Phone Number: (510) 540-3841

III. ENVIRONMENTAL RESOURCES POTENTIALLY AFFECTED

The boxes checked below identify environmental resources in the following ENVIRONMENTAL SETTING/IMPACT ANALYSIS section found to be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact "

☐ None Identified	☐ Aesthetics	☐ Agricultural Resources
☐ Air Quality	☐ Biological Resources	☐ Cultural Resources
☐ Geology And Soils	☐ Hazards and Hazardous Materials	☐ Hydrology and Water Quality
☐ Land Use and Planning	☐ Mineral Resources	☐ Noise
☐ Population and Housing	☐ Public Services	☐ Recreation
☐ Transportation and Traffic	☐ Utilities and Service Systems	

IV. ENVIRONMENTAL IMPACT ANALYSIS

The following pages provide a brief description of the physical environmental resources that exist within the area affected by the proposed project and an analysis of whether or not those resources will be potentially impacted by the proposed project. Preparation of this section follows guidance provided in DTSC's California Environmental Quality Act Initial Study Workbook [Workbook]. A list of references used to support the following discussion and analysis are contained in Attachment A and are referenced within each section below.

Mitigation measures which are made a part of the project (e.g.: permit condition) or which are required under a separate Mitigation Measure Monitoring or Reporting Plan which either avoid or reduce impacts to a level of insignificance are identified in the analysis within each section.

1. Aesthetics

Project activities likely to create an impact:

The project involves injecting hydrogen releasing compound and Bio-Inoculum (HRC/BIO) into impacted groundwater areas by means of drilling temporary borings in a grid pattern at pre-determined spacing to be used as injection points. In addition, three monitoring wells will be installed to assess the performance of the removal action. These activities are not anticipated to alter the aesthetic character of the area.

Description of Environmental Setting:

The project site is located in the northern portion of the City of Richmond. San Pablo Bay is located less than two-thirds of a mile west of the project site. The project site is not part of a publicly accessible and/or designated scenic vista. The site is part of an industrial area characterized by one- and two-story industrial-style buildings of various designs. The site is bounded by the Union Pacific Railroad to the west, Morton Avenue to the north, and on the east and south by the former Witco Argus Corporation property. A high-pressure gasoline pipeline, operated by Kinder-Morgan Energy Partners (formerly Southern Pacific/Santa Fe International Pipeline Company (SFPC)) runs through the west side of the site, at an

approximate depth of seven feet below ground surface. Beyond this and west of the railroad is the largely undeveloped Breuner Property. The Breuner Property and beyond to the San Pablo Bay, approximately three-quarters of a mile west, presently consists of undeveloped fields and marshlands and a miniature aircraft landing strip A residential community, Parchester Village, is located adjacent to and north of Morton Avenue, located at the northern property boundary of the subject site.

Analysis of Potential Impacts Describe to what extent project activities would:

a. Have a substantial adverse effect on a scenic vista.

No Impact. The project activities consist of injecting HRC/BIO into the impacted groundwater areas by means of drilling borings, and installing three monitoring wells to assess the performance of the removal action. These activities will not block any views, or obstruct any scenic vista or view open to the public, and/or result in an aesthetically unpleasant site.

b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings and historic buildings within a state scenic highway.

No Impact. No scenic sources will be affected by project activities. The project activities include injection of HRC/BIO into the impacted groundwater areas by means of drilling borings, and installing three monitoring wells to assess the performance of the removal action. The nearest state scenic highway is Route 24, approximately 25 miles southeast of the Site.

c. Substantially degrade the existing visual character or quality of the site and its surroundings.

No Impact. The project activities will require injection of HRC/BIO into the groundwater by means of drilling borings, and installing three monitoring wells to assess the performance of the removal action. These activities will not have any impact on the visual character or quality of the Site.

d. Create a new source of substantial light of glare that would adversely affect day or nighttime views in the area.

No Impact. The project activities involve injection of HRC/BIO into the groundwater, and installing three monitoring wells to assess the performance of the removal action. These activities will not create any new source of substantial light of glare that would adversely affect day or nighttime views in the area.

Specific References (List a, b, c, etc):

a, c, d) CSS Environmental Service, Inc., Draft Removal Action Workplan for Reaction Products, Section 5.1, Page 24. May 2006.

b) California Department of Transportation, Scenic Highway Program, California Scenic Highway Mapping System, Route 24 (http://www.dot.ca.gov/hq/LandArch/scenic_highways/scenic_hwy.htm).

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

2. Agricultural Resources

Project activities likely to create an impact:

The proposed removal action combines injection of a HRC/BIO into the impacted groundwater, and the installations of three monitoring wells to assess the performance of the removal action. Groundwater sampling will be performed for an estimated two year period. DTSC will conduct oversight activities to ensure that the removal action activities are implemented in accordance with the approved workplans. The proposed project will not alter the land use of the Site.

Description of Environmental Setting:

The project site is located at 840 Morton Avenue in Richmond, California, and consists of approximately 3 acres in a light industrial area. The project site is bounded by the Union Pacific Railroad to the west, Morton Avenue to the north, and on the east and south by the former Witco Argus Corporation property. Currently, the site is occupied, partially paved, and enclosed with cyclone fencing with a locked gate. Site structures include a main building with an attached warehouse, a metal prefabricated storage building (small storage building), and 9 above-ground storage tanks within secondary containment.

Analysis of Potential Impacts. Describe to what extent project activities would:

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.

No Impact. The project site is located in a light industrial area, and there are no agricultural resources or operations onsite. The proposed project would not convert farmland to nonagricultural use or conflict with zoning for agricultural uses. Therefore, implementation of the proposed project would have no impact on agricultural resources.

b. Conflict with existing zoning or agriculture use, or Williamson Act contract.

No Impact. For at least the past forty years, the project site has been in use as an industrial facility The project site would therefore not be subject to the California Land Conservation Act of 1965 (Williamson Act contract), which offers landowners property tax relief in return for the landowners' guarantee (through an executed contract) that their land will be used solely for agricultural or open space activities over a ten-year period

c. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural uses.

No Impact. The City of Richmond Zoning Ordinance does not identify any existing farmland on the project site or in the vicinity. The proposed project activities will not alter the land use of the site, and would therefore have no impact on agricultural resources.

Specific References (list a, b, c, etc):

a, b, c) City of Richmond, January 1997, Zoning Ordinance, Page 30 and Zoning Map;

a) California Resources Agency, Division of Land Resources Protection, Farmland Mapping and Monitoring Program (http://www.consrv.ca.gov/dlrp/index.htm);

b) California Resources Agency, Division of Land Resources Protection, Williamson Act Program (http://www.consrv.ca.gov/dlrp/index.htm);

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

3. Air Quality

Project activities likely to create an impact:

Construction activities could result in short-term air quality impacts such as dust generated by drilling, exhaust emissions from gas and diesel powered construction equipment, and vehicular emissions associated with commuting of construction workers. The BAAQMD does not recommend a detailed air quality analysis for projects generating less than 2,000

vehicle trips per day. This project will generate approximately 25 trips per day, which is much less than 2,000 vehicle trips per day; therefore, it is less than significant.

Description of Environmental Setting:

The project site is located in the northern part of the City of Richmond, near the town of San Pablo, within the San Francisco Bay Area (Bay Area) Air Basin. The Bay Area Air Basin encompasses the nine county region including all of Alameda, Contra Costa, Santa Clara, San Francisco, San Mateo, Marin and Napa Counties, and the southern portions of Solano and Sonoma Counties

Analysis of Potential Impacts Describe to what extent project activities would:

a. Conflict with or obstruct implementation of the applicable air quality plan.

Less-Than-Significant. Bay Area Air Quality Management District (BAAQMD) Regulation 6 limits particulate matter by placing limitations on emission rates, concentration, visible emissions, and opacity. Visible emissions of particulate matter will result from drilling activities. Drilling equipment will be used to implement the project over a two-week period. Compliance with BAAQMD rules would assure that this impact would be less than significant.

b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Less-Than-Significant. Local particulate standard may be temporarily exceeded onsite. If necessary, dust suppression techniques such as spraying the soil with water will be employed to reduce visible dust emissions.

c Result in cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

Less-Than-Significant. Project controls were designed into the project to avoid or reduce human or environmental exposure to contaminants.

d. Expose sensitive receptors to substantial pollutant concentrations.

Less-Than-Significant. DTSC does not believe that the proposed remedial action will impact any nearby sensitive receptors. DTSC staff conducted a drive-by on July 19, 2004 to determine the distance of sensitive receptors to the site. The closest residence is about one block from the site. The closest school is approximately 1 mile from the site. The closest hospital is approximately 3 miles from the site.

The site will be secured utilizing the existing fencing to reduce the potential for unauthorized personnel to enter the site area. Although volatile organic compounds are not expected to be encountered, air monitoring of the workers' breathing zones will be conducted using a direct-reading vapor analyzer, or photoionization detector, during well/boring installation as well as groundwater purging activities, consistent with standard health and safety procedures for monitoring worker exposures. If volatile organic compounds are detected above ambient concentrations in the breathing zone, volatile organic controlling efforts will be applied.

e. Create objectionable odors affecting a substantial number of people.

Less-Than-Significant. During drilling activities, water trucks will be used to spray the surface soils to suppress dust and vapor formation. This measure will meet local air quality standard and will not expose people to substantial pollutant concentrations or odors.

f. Result in human exposure to Naturally Occurring Asbestos (see also Geology and Soils, f).

No Impact. Based on the Department of Conservation, California Geological Survey, the site area does not contain asbestos.

Specific References (list a, b, c, etc):

a, b) Bay Area Air Quality Management District (BAAQMD), Rules and Regulations, Regulation 6. October 1998.

c, d) CSS Environmental Service, Inc., Health and Safety Plan, Section 3.0. September 2004.

e) Bay Area Air Quality Management District (BAAQMD), Rules and Regulations, Regulation 7. October 1998.

f) Bay Area Air Quality Management District (BAAQMD), Rules and Regulations, Regulation 11. October 1998.

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☒ Less Than Significant Impact
☐ No Impact

4. Biological Resources

Project activities likely to create an impact:

The project activities consist of injecting HRC/BIO into the impacted groundwater areas by means of drilling borings, and installing three monitoring wells to assess the performance of the removal action. These activities will not affect biological resources on the site.

Description of Environmental Setting:

The project site consists of approximately 3 acres in a mixed industrial/residential neighborhood, and is bounded by the Union Pacific Railroad to the west, Morton Avenue to the north, and on the east and south by the former Witco Argus Corporation property. Currently, the site is occupied, partially paved, and enclosed with cyclone fencing with a locked gate Site structures include a main building with an attached warehouse, a metal prefabricated storage building (small storage building), and 9 above-ground storage tanks within secondary containment.

Analysis of Potential Impacts. Describe to what extent project activities would:

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.:

No Impact. The project site was originally developed for commercial use in 1959; according with Richmond General Plan, the site does not contain any critical habitat or endangered species. Therefore, the project would not impact any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service Therefore, there is no impact.

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

No Impact. No riparian habitat or other sensitive natural communities occur on the property. The highly disturbed banks of Rheem Creek do not support riparian vegetation.

c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

No Impact. Despite the fact that the project area is located near San Pablo, no adverse effect will occur on federally protected wetlands because no work is being conducted offsite.

d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

No Impact. The project as proposed would not interfere with the movement of any native resident or migratory

fish or wildlife corridors, or impede the use of native wildlife nursery sites.

e. Conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

No Impact The site is zoned as a light industrial area. No rare or endangered biological species were observed in the project area during remedial investigation activities conducted at the site or in the City of Richmond General Plan, Open Space and Conservation Map. The proposed project would therefore not conflict with any local policies or ordinances protecting biological resources.

f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan

No Impact. The project activities will not create any conflict with any federal, estate of local planning with regard to habitat and natural community conservation or any other ordinance The site areas have been zoned for industrial use.

Specific References (list a, b, c, etc):

a, b) California Department of Fish & Game, CNDDB, Rarefind Report, 2003.

c, d, e, f) City of Richmond. General Plan, Volume One, Land Use and Open Space & Conservation Maps. August 1994.

f) City of Richmond, Zoning Ordinance, Industrial Zoning District M-2. January 1997.

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

5. Cultural Resources

Project activities likely to create an impact:

The project activities consist of injecting HRC/BIO into the impacted groundwater areas by means of drilling borings, and installing three monitoring wells to assess the performance of the removal action. These activities will not affect cultural resources on the site.

Description of Environmental Setting:

In March 2000, the proposed project area was field surveyed and a cultural resource record search was performed (Busby, 2000). This research found no recorded Native American sites or known ethnographic settlements, no historic era archaeological or significant architectural resources, no surface evidence of prehistoric or significant historic era resources; and no local, state, or federal historically or architecturally significant structures, landmarks, or points of interest could be identified. In addition, the project surface appears to have been historically filled and graded (Busby, 2000). Based on these facts, there does not appear to be any potential to either change or affect cultural resources in the area and/or cause an impact to a unique cultural resource on or near the site.

Analysis of Potential Impacts. Describe to what extent project activities would:

a. Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5.

No Impact. There is no chance to cause a substantial adverse change in the significance of a historical resource. The project site is not known to contain any historic resources as defined in CEQA Section 15064.5. Therefore, there is no impact.

b. Cause a substantial adverse change in the significance of an archeological resource pursuant to 15064.5.

No Impact. There is little chance of causing any substantial changes in the significance of archeological resources. No recorded Native American sites or known ethnographic settlements, no historic era archaeological or significant architectural resources, no surface evidence of prehistoric or significant historic era resources; and no local, state, or federal historically or architecturally significant structures, landmarks, or points of interest were identified during previous investigation. In addition, the project surface appears to have been historically filled and graded. Based on these facts, there does not appear to be any potential to either change or affect cultural resources in the area and/or cause an impact to a unique cultural resource on or near the site.

c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

No Impact. The Richmond General Plan, Open Space & Conservation Map does not identify any area near the site that may have human remains.

d. Disturb any human remains, including those interred outside of formal cemeteries.

No Impact. Numerous borings have been drilled on site since 1983 and no human remains were uncovered at the project site. The Richmond General Plan, Open Space & Conservation Map does not identify any area near the site that may have human remains. However, State law now requires that if human remains are encountered in any location other than a dedicated cemetery, all drilling/excavation must cease at the site or any nearby area reasonably suspected to overlie adjacent human remains until the Applicant complies with the procedure outlined in CEQA section 15064.5.

Specific References (list a, b, c, etc):

a, b, c) City of Richmond General Plan, Volume One, Open Space & Conservation Map. August 1994.
Busby, Colin I., Principal, Basin Research Associates, letter to Ms. Alecia Wilmeth of Panattoni Construction, March 31, 2000.

d) CSS Environmental Services, Inc., *Final Remedial Investigation/Baseline Risk Assessment, Background Section*. July 2003 .
Busby, Colin I., Principal, Basin Research Associates, letter to Ms. Alecia Wilmeth of Panattoni Construction, March 31, 2000.

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

6. Geology and Soils

Project activities likely to create an impact:

The project activities consist of injecting HRC/BIO into the impacted groundwater areas by means of drilling borings, and installing three monitoring wells to assess the performance of the removal action. These activities will not affect geology and soils on the site.

Description of Environmental Setting:

The project site is located on nearly level terrain approximately one-half mile east of San Pablo Bay. The general lithology of the site is comprised of fill from about 0 to 7-10 feet (ft) below ground surface (bgs) underlain by unconsolidated interbedded sand, silt and organic clay. Two sandy water-bearing units have been previously identified, separated by a silty/clayey aquitard. The water table varies seasonally from about 10 ft bgs. Generally, the upper water-bearing zone is unconfined or semi-confined and is first encountered between about 5 and 20 feet bgs and ranges in thickness from about

8 to 15 feet. The lower "A" unit is confined or semi-confined, and is first encountered between about 25 and 45 feet bgs and ranges in thickness from 5 to 30 feet. In some areas, these units may merge and become one unit.

Analysis of Potential Impacts. Describe to what extent project activities would:

a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

- Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. (Refer to Division of Mines and Geology Special Publication 42).

  No Impact. The project involves the injection of HRC/BIO into impacted groundwater areas by means of drilling temporary borings, and the installations of three monitoring wells to assess the performance of the removal action. No structures are being built, and these activities will not affect the geology and soils on the site.

- Strong seismic ground shaking.

  No Impact. The project involves the injection of HRC/BIO into impacted groundwater areas by means of drilling temporary borings, and the installations of three monitoring wells to assess the performance of the removal action. No structures are being built, and these activities will not affect the geology and soils on the site.

- Seismic-related ground failure, including liquefaction

  No Impact. The project involves the injection of HRC/BIO into impacted groundwater areas by means of drilling temporary borings, and the installations of three monitoring wells to assess the performance of the removal action. No structures are being built, and these activities will not affect the geology and soils on the site.

- Landslides.

  No Impact. Most of the project area is flat to gently sloping and not subject to land sliding.

b. Result in substantial soil erosion or the loss of topsoil.

No Impact. Soils at the project area are either artificial fill or are over-covered, and do not constitute topsoil; therefore, the project activities would not have the potential to impact topsoil. The project will be carried out during the dry season; therefore, soil erosion is unlikely to occur.

c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

No Impact. According to the 1994 Richmond General Plan Technical Appendix, Volume 2, the soil groups present at the project site in the upper 200 feet are primarily alluvial deposits, which are susceptible to liquifaction. However, the project is not located on a hillside and involves the injection of HRC/BIO into impacted groundwater areas by means of drilling temporary borings, and the installations of three monitoring wells to assess the performance of the removal action. No structures are being built, and these activities will not affect the geology and soils on the site.

d Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.

No Impact. Portions of the project site could contain expansive soils, but no structures are being built, and the project activities will not affect the geology and soils on the site.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of water.

No Impact. The project site is served by municipal sewerage systems, and the use of septic systems is not anticipated.

Specific References (list a, b, c, etc):

a) CSS Environmental Services, Inc., Draft Removal Action Workplan for Reaction Products. May 2006.

b) City of Richmond. General Plan, Volume Two, Pages B-7, B-8, and B-9. August 1994

CSS Environmental Services, Inc., Final Remedial Investigation/Baseline Risk Assessment, Section V. July 2003.

c) City of Richmond. General Plan, Volume Two, Pages B-7, B-8, B-9, B-10 and B-11. August 1994.

d) CSS Environmental Services, Inc., Draft Removal Action Workplan for Reaction Products. May 2006.

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

7. Hazards and Hazardous Materials

Project activities likely to create an impact:

The project activities consist of injecting HRC/BIO into the impacted groundwater areas by means of drilling borings, and installing three monitoring wells to assess the performance of the removal action.

Description of Environmental Setting:

The project site is located on Morton Avenue in a mixed industrial/residential neighborhood, and is bounded by the Union Pacific Railroad (railroad) to the west, Morton Avenue to the north, and on the east and south by the former Witco Argus Corporation property (Witco site). A residential community, Parchester Village, is located adjacent to and north of Morton Avenue. A soil source removal action (excavation) was previously performed at the southern end of the small storage building to remove soil contaminated with trichloroethylene (TCE).

Analysis of Potential Impacts. Describe to what extent project activities would:

a. Create a significant hazard to the public or the environment throughout the routine transport, use or disposal of hazardous materials.

Less-than-Significant. Because subsurface investigations have been conducted on the site and identified contaminants removed or deemed to be of low risk by regulatory agencies, drilling boreholes for the purpose of injecting HRC/BIO into the groundwater is not expected to result in hazardous emissions or improper disposal of hazardous material. HRC/BIO is not a hazardous material.

b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

Less-Than-Significant. Improper management of hazardous materials or accidental release could pose a substantial hazard to human health and the environment. However, management of hazardous materials during drilling activities will comply with applicable laws; therefore, this impact is considered less than significant.

c Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school.

Less-Than-Significant. The schools nearest to the project site are Bayview Elementary at 3001 16th Street and Lake Elementary at 2200 11th Street, both in San Pablo. Both schools are more than one-quarter mile from the project site. HRC/BIO is not hazardous or acutely hazardous material

d Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962 5 and, as a result, would it create a significant hazard to public or the environment.

Less-Than-Significant. The Reaction Products site is included on the list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. However, contaminated soil has been remediated to residential standards. Therefore, the project would not create a significant hazard to the public or the environment.

e. Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.

Less-Than-Significant. Implementation of the proposed project would not interfere with or impair implementation of an adopted emergency response plan or emergency evacuation plan During drilling activities, an Emergency Response Plan would be implemented that would ensure adequate emergency access to and through the project area. Therefore, this impact is considered less than significant.

Specific References (list a, b, c, etc):

a) Weiss Associates, *Final Removal Action Report for Reaction Products*, Source removal near RP-15. December 1998.

b) CSS Environmental Services, Inc., Draft Removal Action Workplan for Reaction Products. May 2006.

c) Department of Toxic Substances Control, Public Participation Plan for Reaction Plan. October 2004.

d) http://www.dtsc.ca.gov

e) CSS Environmental Services, Inc., Draft Removal Action Workplan for Reaction Products. May 2006.

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☒ Less Than Significant Impact
☐ No Impact

8. Hydrology and Water Quality

Project activities likely to create an impact:

No significant impacts to surface and ground water are anticipated from the proposed project. The proposed project includes injecting HRC/BIO into impacted groundwater areas by means of drilling borings, and installing three monitoring wells to assess the performance of the removal action. Deeper groundwater at the site is not potable, but does discharge into the Bay.

Description of Environmental Setting:

The site lies at an elevation of approximately 25 feet above mean sea level. Ground surface in the site vicinity is relatively flat and the slope is generally directed northwest towards the San Pablo Bay. The Bay, located approximately 1-mile northwest of the site, is the predominant hydrologic feature, and flows in a southward direction towards the Pacific Ocean. There are no surface drinking water intakes or public drinking water supplies located within 3-miles of the Site. A wetland/marsh area is located approximately ½-mile from the site. Two sandy water-bearing units have been previously identified, separated by a silty/clayey aquitard. The water table varies seasonally from an average depth of about 10 ft bgs Generally, the upper water bearing zone is unconfined or semi-confined, and is first encountered between about 5 and 20 feet bgs and ranges in thickness from about 8 to 15 feet. The lower "A" unit is confined or semi-confined, and is first encountered between about 25 and 45 feet bgs and ranges in thickness from 5 to 30 feet. In some areas these units may merge and become one unit. Further details of possible interconnections are discussed below.

Analysis of Potential Impacts. Describe to what extent project activities would:

Describe to what extent project activities would:

a. Violate any water quality standards or waste discharge requirements.

No Impact. The proposed project does not include any actions or activities that would require waste discharge or impair any water resources according to water quality standards. The project should result in an improvement to existing water quality.

b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficient in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

No Impact. Based on approximate measurements in existing borings, shallow groundwater is anticipated to occur at depths of about 10 feet. The deeper groundwater in the area is brackish and not suitable for drinking. Recharge to the shallow aquifer is likely to occur through those soils, and is limited to the wet months. Given the above, the proposed project would not have a significant impact to groundwater recharge.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off-site.

No Impact. The proposed project includes drilling of temporary boreholes to inject HRC/BIO into the impacted groundwater areas, and installing three groundwater monitoring wells to assess the performance of the removal action. These activities would not alter the existing drainage pattern of the site or area, and there are no streams or rivers near the site

d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off-site.

No Impact. The proposed project includes drilling of temporary boreholes to inject HRC/BIO into the impacted groundwater areas, and installing three groundwater monitoring wells to assess the performance of the removal action. These activities would not alter the existing drainage pattern of the site or area, and there are no streams or rivers near the site.

e. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

See response 8c above.

f. Otherwise substantially degrade water quality.

See response 8a above.

g. Place within a 100-flood hazard area structures which would impede or redirect flood flows.

No Impact. The project site is located outside the mapped 100-year floodplain. No flooding would result from changes in drainage patterns. Any changes in water quality are anticipated to be positive since the exposure to the contaminated groundwater has been eliminated.

h. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

Less-Than-Significant. The proposed project is not downstream of a levee or dam. Therefore, the project would not expose people or structures to risk of loss associated with failure of a levee or dam.

i. Inundation by sieche, tsunami or mudflow.

Less-Than-Significant. Tsunamis are seismically generated sea waves that travel across the open water of San Pablo Bay, and cause flooding at or near the site. Tsunamis are unlikely to cause flooding on the project site, considering its location within the San Pablo Bay. Seiches are a more localized phenomenon, whereby a sloshing action in a confined body of water, particularly in a linear shape, may cause flooding. Within the project site, seiches could occur within the standing water of the drainage swales. However, the volume of water in the drainage swales would be so small that it is unlikely it would cause any damage. Mudflows originate when over saturation of sloping ground triggers movement and possible down-slope damage. Due to the relatively flat surface of the site, mudflows are considered to have very low likelihood of occurrence Therefore, impacts related to tsunamis, seiches, and mudflows for the project would be less than significant.

Specific References (list a, b, c, etc):

a,b,c,d, e, f) CSS Environmental Services, Inc., Draft Removal Action Workplan for Reaction Products, Removal Action Implementation Section. May 2006

g) U S. Department of Housing and Urban Development, Flood Insurance Rate Map, City of Richmond, Panel Number 060035 0015 B.

h, i) City of Richmond, Richmond General Plan, Volumes One and Two, August 1994, as amended through May 1996

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☒ Less Than Significant Impact
☐ No Impact

9. Land Use and Planning

Project activities likely to create an impact:

This Site and surrounding area is zoned commercial and residential, and is expected to remain so for the foreseeable future. The proposed project will not alter the land use of the site and will remediate the affected site groundwater to levels compatible with the existing land use.

Description of Environmental Setting:

Currently, the site is occupied, partially paved, and enclosed with cyclone fencing with a locked gate. Site structures include a main building with an attached warehouse, a metal prefabricated storage building, and nine aboveground storage tanks within secondary containment. Primary land use to the north of the site is residential, immediately to the west is wetland/marsh area, and the primary land uses to the south and east are commercial and light industrial. The subject site is located in a light industrial zone.

Analysis of Potential Impacts. Describe to what extent project activities would:

a. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect

No Impact. In general, development in the City of Richmond is guided by both the Land Use and the Open Space and Conservation Elements of the Richmond General Plan and the City of Richmond's Zoning Ordinance. The project site is located in an area designated by the City of Richmond's 1994 General Plan for *Light Industry* use. The proposed project does include any development and would therefore not conflict with any land use plan or policy, or with any agency outside of the City of Richmond with jurisdiction over the project site.

b. Conflict with any applicable habitat conservation plan or natural community conservation plan.

No Impact. The project site is not noted in the General Plan as part of a Habitat Conservation Plan (HCP) nor any other natural communities conservation plan, nor is it adjacent to any area subject to an HCO or natural communities conservation plan. As a result, the proposed project would not conflict with an HCP or natural communities conservation plan.

Specific References (list a, b, c, etc):

a, b) City of Richmond, Richmond General Plan, Volumes One and Two. August 1994.

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

10. Mineral Resources

Project activities likely to create an impact:

No impacts on mineral sources from the proposed project have been identified. The proposed project is the injection of HRC/BIO into the affected groundwater areas by means of drilling borings. The project site is currently zoned for commercial and residential use. The deeper groundwater at the site is not potable due to high levels of total dissolved solids.

Description of Environmental Setting:

The site lies at an elevation of approximately 25 feet above mean sea level (MSL) [USGS, 1964] Ground surface in the site vicinity is relatively flat and the slope is generally directed northwest towards San Pablo Bay, the predominant hydrologic feature, located approximately 1-mile northwest of the site, flows in a southward direction towards the Pacific Ocean. There are no surface drinking water intakes or public drinking water supplies located within 3-miles of the Site. A wetland/marsh area is located approximately ½-mile from the site.

Analysis of Potential Impacts. Describe to what extent project activities would:

a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

No Impact. The proposed project site would be located entirely within an area designated as MRZ-1, indicating that no significant mineral deposits are present or likely to be present. Therefore, the construction of the project would not reduce the availability of any minerals that could be of value to the region or state. Given the above, no impacts are anticipated.

b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

See response to Item 10a above. There are no operational mineral resource recovery sites in the project area whose operations or accessibility would be affected by the construction and operation of the project.

Specific References (list a, b, c, etc):

a, b) City of Richmond, General Plan, Volume One, Open Space and Conservation Map. August 1994.

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact

☒ No Impact

11. Noise

Project activities likely to create an impact:

The proposed project activities-generated noise could result in a temporary, adverse impact on the existing uses. The operation of heavy equipment, i.e., drilling equipment, backhoe, trucks, etc , is usually noisy. Sound level monitoring would be conducted at the project site. Hearing protection would be provided to all exposed workers should the noise levels exceed a time weighted average of 85 dBA (decibels, a-weighted scale) The local noise ordinances for industrial area are 75 dBA and for residential area is 55 dBA at the property boundaries. Construction activities will be done between the period of 7 a.m and 5 p.m. If sound level monitoring detects unacceptable noise level as allowed by the local noise ordinances, mitigation measure such as lowering the noise level of the equipment or limited construction hours would be taken. With the implementation of these measures, the impact of the project activities would be reduced to a less-than-significant level.

Description of Environmental Setting:

The project site is located in a commercial/industrial and residential area. The sensitive receptors consist of housing and commercial development. The proximity of sensitive receptors to the project site is about 100 feet. Implementation of activities is expected to occur between 7 a.m. and 6 p.m. Monday through Friday in compliance with the City of Richmond noise ordinance. At least 24-hour notice will be provided to nearby residents of any change to this schedule.

Analysis of Potential Impacts. Describe to what extent project activities would:

a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

   Less-Than-Significant. The operation of heavy equipment is usually noisy. Hearing protection will be provided to all exposed workers should the noise level exceed a time weighted average of 85 decibels (dBA), and access to the site will be controlled. All local noise ordinances will be followed. Ordinances include restriction of noise level to below 70 dBA at the property line of the site and a restriction of construction activities to between 7 a.m. and 6 p.m.. If sound level monitoring detects unacceptable noise levels as allowed by local ordinances, measures such as limiting construction hours will be taken. The noise generated by the construction equipment is not anticipated to exceed the above mentioned thresholds; consequently, less than significant project impacts on background noise levels is expected.

b. Exposure of persons to or generation of excessive groundbourne vibration or groundbourne noise levels.

   Less-Than-Significant. Given the land uses permitted, no substantial project-related source of groundbourne noise or vibration would exist on the site Existing sources of noise and vibration that affect the site include rail traffic on the two railroads and truck traffic on the Richmond Parkway and Giant Road.

c. A substantial permanent increase in ambient noise levels in the vicinity above levels existing without the project.

   Less-Than-Significant. The overall increase in ambient noise resulting from the proposed project will be estimated using the FHWA roadway model and the traffic volumes of the transportation analysis. Under existing conditions, roadway noise along Giant Road is 64.0 dBA

d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

   Less-Than-Significant. Construction equipment could result in the temporary increase of noise levels in the project vicinity. Peak construction noise levels can reach 85 to 89 dBA at a distance of 50 feet from equipment. Construction noise levels are regulated by the City's Noise Ordinance, including hours of operation. Construction noise of 89 dBA at a distance of 50 feet could result in noise levels of 77 dBA at a distance of 200 feet, the approximate distance to the nearest sensitive receptor. Construction noise

could result in elevated noise levels during daytime hours at the nearest sensitive receptors. However, given the temporary nature of construction noise, this daytime impact is not considered to be substantial.

Specific References (a, b, c, etc):

a, b, c, d) City of Richmond. General Plan, Volume Two, Section C, August 1994.

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☒ Less Than Significant Impact
☐ No Impact

12. Population and Housing

Project activities likely to create an impact:

No significant impacts have been identified on population and housing from the proposed project. The proposed project has the beneficial impact by eliminating potential exposures to the public and the environment to the contaminated groundwater in the area. The site is currently zoned for commercial use and the proposed project would not alter future use of the site

Description of Environmental Setting:

The project site is located in a commercial and residential area. Because surrounding areas to the north, south and east of the project site are currently served by public utilities, and because surrounding areas are already designated for industrial use, the proposed project would not, by itself, induce population growth. Employees working at the project site are likely to already live in the Bay Area, and are unlikely to move to the City of Richmond for employment. The proposed project is therefore unlikely to induce substantial population growth.

Analysis of Potential Impacts. Describe to what extent project activities would:

a. Induce substantial population growth in area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)

No Impact The project does not include specific development. As such, the proposed project would not induce additional growth in the area.

b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.

No Impact. The proposed project site is zoned for light industrial use and is not occupied by residential structures, and therefore the proposed project would not displace existing housing.

c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

The proposed project site has been in use for industrial purposes for at least the past 40 years. Only structures related to industrial use exist on the project site. The project would therefore not displace any persons

Specific References (list a, b, c, etc):

a) CSS Environmental Services, Inc., Draft Removal Action Workplan for Reaction Products, Removal Action Implementation Section May 2006

b, c) City of Richmond, Zoning Ordinance, January 1997.

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

13. Public Services

Project activities likely to create an impact:

No need for or effects on government services have been identified for the proposed project. During project implementation there could be a demand on fire, ambulance, and hospitals in the event of an accident. The level of this demand relative to existing demand is anticipated to be minimal.

Description of Environmental Setting:

A residential community, Parchester Village, is located adjacent to and north of Morton Avenue, located at the northern property boundary of the site. The City of Richmond Police Department provides police service. Implementation of the proposed project will involve construction workers on the site over a period of two weeks during the daytime who will not require additional public services at the project site.

Analysis of Potential Impacts. Describe to what extent project activities would:

a. Result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:

- Fire protection

No impact. The Richmond Fire Department (RFD) provides fire fighting and emergency medical services to the project area. The RFD also has automatic aid response agreements with the West Contra Costa County Fire District, which serves San Pablo, El Sobrante, El Cerrito, Kensington, and unincorporated areas of the county. The proposed project would not increase demand for fire protection and emergency services.

- Police protection

No impact. The City of Richmond Police Department provides police service to this area. The project duration is relatively short (4-6 weeks) and thus police service demand is anticipated to be low; therefore, the impact to the Richmond Police Department would be less than significant.

- Schools

No impact. The West Contra Costa Unified School District (WCCUSD) provides public school services for the cities of Richmond, El Cerrito, Hercules, Pinole, San Pablo and the unincorporated areas of El Sobrante, Kensington, North Richmond and Tara Hills. There are two schools located near the project site: Bayview Elementary School and Lake Elementary School, located less than one-half of a mile to the east and southeast in the City of San Pablo. The proposed project would not generate additional students to any of the neighboring schools in the District. The project would not require WCCUSD to build an additional school; therefore, no impacts would results.

- Parks

No impact. The proposed project would not be anticipated to add residents to the north Richmond area, and therefore, no additional parkland would be required. The existing park and recreational facilities would be able to serve the additional residents of the area. The proposed project would not require the City to build an additional park.

- Other public facilities

No impact. On other public services have been identified as being adversely affect by the proposed project.

Specific References (list a, b, c, etc):

a) City of Richmond. General Plan, Volume Two, Section D August 1994

CSS Environmental Services, Inc., Draft Removal Action Workplan for Reaction Products, Removal Action Implementation Section. May 2006.

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

14. Recreation

Project activities likely to create an impact:

No impacts have been identified on recreation from the proposed project. The proposed project has the beneficial impact of eliminating potential exposures by the public and the environment to the contaminated groundwater at the site. The site area is currently zoned for light industrial, and the proposed project would not alter future use of the site.

Description of Environmental Setting:

Currently, the site is occupied, partially paved, and enclosed with cyclone fencing with a locked gate. Site structures include a main building with an attached warehouse, a metal prefabricated storage building, and 9 above-ground storage tanks within secondary containment. Primary land use to the north of the site is residential, immediately to the west is wetland/marsh area, and the primary land uses to the south and east are commercial and light industrial. The subject site is located in a light industrial area zoned Richmond M-2.

Analysis of Potential Impacts. Describe to what extent project activities would:

a Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

No impact. The project does not propose a specific development of the site, and therefore, will not cause impacts to the existing recreation amenities.

b. Include recreational facilities or require construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

No impact. The project will not affect the City's land use policy or regulations, and does not propose a specific development of the site, and therefore, will not cause an increase in demand for parks and recreation facilities or impacts that will require expansion of parks.

Specific References (list a, b, c, etc):

a, b) City of Richmond. General Plan, Volume Two, Section E. August 1994.

CSS Environmental Services, Inc., Draft Removal Action Workplan for Reaction Products, Removal Action Implementation Section. May 2006.

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

15. Transportation and Traffic

Project activities likely to create an impact:

This project will not involve or result in a significant change of transportation due to the limited scope of activities requiring vehicular movement, i.e. the project will generate approximately 25 vehicle trips per day for approximately 2 weeks for a total of approximately 250 vehicle trips. Consequently, the project traffic will not impact intersections or roadway links and will not increase traffic volumes on nearby roadways by 10%; thus meeting BAAQMD guidelines threshold criteria of less than significant impact. The equipment used for implementation of removal activities will be stored onsite and there will be no need for construction of a new parking facility These activities will not impact waterborne, rail, bicycle, or pedestrian traffic. Total emissions from project operations are expected to be less than the daily thresholds established by the BAAQMD.

Description of Environmental Setting:

Regional access is provided by Interstate 80 (I-80) and I-580. *I-80* runs north-south and provides regional access to the site via Richmond Parkway and San Pablo Avenue. *I-580* runs east-west and provides regional access to the site via Richmond Parkway.

Richmond Parkway is a four- to six-lane urban arterial, linking I-80 near Hilltop with I-580 at two interchanges (Castro Street and Canal Boulevard) near the Richmond-San Rafael Bridge. The speed limit on Richmond Parkway in the project vicinity is 50 miles per hour (MPH). San Pablo Avenue is a four-lane arterial that runs in the north-south direction parallel to I-80. The speed limit on San Pablo Avenue in the project vicinity is 45 MPH. Giant Road is a two-lane road that runs north-south, bounded by Parr Boulevard in the south, and becomes Atlas Road in the north. The speed limit on Giant Road in the project vicinity is 35 MPH. Collins Avenue is a two-lane road that parallels Giant Road, separated by the Atcheson Topeka and Santa Fe (AT&SF) railroad tracks that also run in the north-south direction. The project site is near the intersection of Collins and Morton Avenues.

Analysis of Potential Impacts. Describe to what extent project activities would:

a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).

   Less-than-Significant. A short term increase in vehicles to and from the project site would occur as a result of implementation activities. The increase in vehicles that would travel to and from the site would occur temporarily throughout the day and probably would not affect community peak hours In addition, the volume of vehicles would be low, given the nature of the project. Therefore, impacts are considered to be less than significant.

b Exceed, either individually or cumulatively, a level of service standard established by the country congestion management agency for designated roads or highway.

   Less-Than-Significant. The project does not involve specific development projects, and therefore, will not cause, either individually or cumulatively, a level of service standard established by the country congestion management agency for designated roads or highway to be exceeded.

c. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

   No Impact. The proposed project does not include the construction or reconstruction of roadway. Therefore, no impacts are expected to occur.

d. Result in inadequate emergency access.

No Impact. The project does not involve the construction of structures or buildings. Therefore, inadequate emergency access would not result due to implementation of the proposed project.

e. Result in inadequate parking capacity.

No Impact. The City's zoning requirements for on-site parking for areas zoned Light Industrial uses is one space per 1,500 square feet of development (City of Richmond, 1997). No development is proposed and the construction equipment will be stored onsite and construction workers can used the site or the parking facilities near by to park their cars while performing cleanup activities. Therefore, no impact is expected to occur.

f. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

No Impact. This project will not involve or result in a significant change of transportation due to the limited scope of activities requiring vehicular movement, i.e. the project will generate approximately 25 vehicle trips per day for approximately 2 weeks for a total of approximately 250 vehicle trips. Consequently, the project traffic will not impact intersections or roadway links and will not increase traffic volumes on nearby roadways. The implementation activities will not impact waterborne, rail, bicycle, or pedestrian traffic. Additional truck traffic will temporarily be generated during implementation activities. Most of the truck traffic will occur during non-peak hours. A transportation plan will be developed to manage the movement of trucks during implementation activities. The transportation plan will be approved prior to the onset of the project. The project would not conflict with adopted policies, plans, or programs supporting alternative transportation.

Specific References (list a, b, c, etc):

a, b, c, d) CSS Environmental Services, Inc., Draft Removal Action Workplan for Reaction Products, Removal Action Implementation Section. May 2006.

e) City of Richmond, Zoning Ordinance. January 1997.

f) City of Richmond, General Plan, Section F. January 1994.

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☒ Less Than Significant Impact
☐ No Impact

16. Utilities and Service Systems

Project activities likely to create an impact:
The project does not include specific development. The nature of the project is such that there will be no demands on utilities and service systems.

Description of Environmental Setting:

The West Contra Costa County Wastewater District (WCCCWD) owns and operates the sewerage system that serves the project area. WCCCWD discharges secondary treated effluent to the Richmond Municipal Wastewater Treatment Plant, where effluents of both facilities area mixed, chlorinated, and discharged to the San Francisco Bay under a joint National Pollutant Discharge Elimination System (NPDES) Permit. The NPDES permit, granted by the Regional Water Quality Control Board, Region 2, identifies waste discharge requirements (WDRs). WDRs are conditions under which the WCCCWD and the City may discharge effluent, and include discharge prohibitions, effluent limitations, receiving water limitations and sludge handling requirements.

The project site is within the water service of East Bay Municipal Utility District.

Richmond Sanitary Service provides solid waste collection service in the vicinity of the project site and disposes it at the West County Landfill. This landfill is near its capacity, and is slated for closure, although the exact date of closure has not been established. Once the landfill is closed, waste will be hauled to the Integrated Resources Recovery Facility located in North Richmond, sorted to reclaim recyclable/reusable material, and the non-reclaimed portion hauled to Protrero Hills Landfill in Solano County.

Analysis of Potential Impacts Describe to what extent project activities would:

a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

No Impact. The proposed project would generate wastewater during well development activities. The wastewater will be temporarily placed in 55-gallon drums and sampled for waste profile and disposal. The proposed project would not require water except for equipment decontamination. Therefore, the project would have no impact.

b Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects

Please see response in subsection a.

c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Not applicable.

d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed.

Please see response in subsection a

e. Result in determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers existing commitments.

Please see response in subsection a.

f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs

Not applicable.

g. Comply with federal, state, and local statutes and regulations related to solid waste.

No Impact. The proposed project would generate a minimum of solid waste and would comply with federal, state, and local statute and regulations. As such, the project would have no impacts.

Specific References (list a, b, c, etc):

a, b, c, d, e, f, g)CSS Environmental Services, Inc., Draft Removal Action Workplan for Reaction Products, Removal Action Implementation Section. May 2006.

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

17. Mandatory Findings of Significance

Analysis of Potential Impacts. Describe to what extent project activities would:

a Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.

As noted in the discussion above, there would not be impacts with respect to noise, air quality, hazards/hazardous materials and transportation/traffic that degrade the quality of the environment.

b. Have impacts that are individually limited but cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

No Impact The cumulative impacts of this project would have the beneficial impact of reducing exposure to hazardous substances/wastes to public health and the environment by remediating the contaminated groundwater. The proposed project would be expected to provide an improvement in environmental quality. In 1998, Reaction Products conducted a soil removal onsite in an effort to eliminate a source of potential groundwater contamination near the rail spur near the western boundary of Reaction Products' property. Approximately 250 cubic yards of volatile organic compounds impacted soil were excavated and stored onsite for treatment. Confirmation sampling results showed that all the contaminated soil has been removed as planned.

South of the site is the former Witco property (currently Chemtura), which also has groundwater contamination underneath it. Since 1983, DTSC has required Witco to conduct hydrogeologic investigations at their site. Witco was required to drill monitoring wells around its surface ponds and next door on Reaction Products' and Bruener's property to determine the extent of its chemical contamination The results of these investigations identified a plume of trimethyltetrahyrofuran (TMTHF) in the groundwater near the locations of the two former surface ponds. TMHF is considered the main hazardous waste contaminant relating to Witco operations. Witco is in the process of addressing its own groundwater contamination under DTSC's supervision. It is not clear at this time what this will consist of. Once remediation has occurred, this project too would have the beneficial impact of reducing exposure to hazardous substances to public health and the environment.

c. Have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly.

No Impacts The purpose of the proposed removal action is to mitigate contaminated groundwater which could have adverse long-term effects on human health and the environment. The proposed project would be expected to provide an improvement in environmental quality.

Specific References (list a, b, c, etc):

a) City of Richmond. General Plan, Volume One, Open Space & Conservation Map. August 1994.

b, c) CSS Environmental Services, Inc., Removal Action Workplan for Reaction Products. May 2006.

Findings of Significance:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☒ Less Than Significant Impact
☐ No Impact

V. FINDING OF DE MINIMIS IMPACT TO FISH, WILDLIFE AND HABITAT ***(Optional)***

Prepared only if a Finding of De Minimis Impact to fish, wildlife and habitat is proposed in lieu of payment of the Department of Fish and Game Notice of Determination filing fee required pursuant to section 711.4 of the Fish and Game Code.

Instructions

A finding of "no potential adverse effect" must be made to satisfy the requirements for the Finding of De Minimis Impact as required by title 14, California Code of Regulations, section 753.5. "No potential adverse effect" is a higher standard than "no significant impact" and the information requested to provide substantial evidence in support of a "no potential adverse effect" is not identical in either its standard or content to that in other parts of the Initial Study

In the *Explanation and Supporting Evidence* section below, provide substantial evidence as to how the project will have **no potential adverse effect** on the following resources:

a) Riparian land, rivers, streams, watercourse, and wetlands under state and federal jurisdiction.

b) Native and non-native plant life and the soil required to sustain habitat for fish and wildlife.

c) Rare and unique plant life and ecological community's dependent on plant life.

d) Listed threatened and endangered plant and animals and the habitat in which they are believed to reside.

e) All species of plant or animals as listed as protected or identified for special management in the Fish and Game Code, the Public Resources Code, the Water Code, or regulation adopted there under.

f) All marine and terrestrial species subject to the jurisdiction of the Department of Fish and Game and the ecological communities in which they reside.

g) All air and water resources the degradation of which will individually or cumulatively result in a loss of biological diversity among the plants and animals residing in that air and water

Explanation and Supporting Evidence
(Note: *Relevant portions of the Initial Study may be referenced where appropriate)*

a) No potential adverse effect on riparian land, rivers, streams, watercourse, or wetlands. No riparian habitat or other sensitive natural communities occur on the property. The highly disturbed banks of Rheem Creek, located approximately 2,500 feet south of the site, do not support riparian vegetation. A band of riparian vegetation occurs south of the property, associated with the levee ditch next to the Union Pacific Railroad tracks. This area would not be disturbed or modified by the proposed project. An undeveloped wetland/habit is located approximately ¾-mile down-gradient from the site.

b) No potential adverse effect. The site is located in an industrial area. Reaction Products has operated the subject site from 1959 to present. The City of Richmond's Zoning Ordinance places the project site within an M-2 Light Industrial District, which permits a variety of uses intended to create, preserve, and enhance areas containing manufacturing, warehousing, trucking and distribution oriented uses. The project as proposed would have no potential adverse effect on native or non-native plant life and the soil required to sustain habitat for fish and wildlife. The nearest wildlife area found in the California Department of Fish and Game, Wildlife Areas, Central Coast Region is San Pablo Bay located about 2 miles west of the site.

c) The project as proposed would have no potential adverse effect on rare and unique plant life and ecological communities dependent on plant life. No rare and unique plant life has been identified or is expected to occur on the site. California Department of Fish and Game Ecological Reserves Map does not show any ecological reserve near the site. The nearest ecological reserve to the site is Marina Islands located a few miles south of the site.

d) The project as proposed would have no potential adverse effect on listed threatened and endangered plant and animals and the habitat in which they are believed to reside The site has been developed for industrial use since 1959 and it is unlikely that suitable habitat remains. The California Department of Fish and Game, Natural Diversity Database does not show any endangered plants or animals for this site.

e) The project as proposed would have no potential adverse effect on any species of plants or animals listed as protected or identified for special management. The site has been developed for industrial use since 1959 and it is unlikely that any plants or animals identified for special management remain onsite. None were identified during previous remedial investigations.

f) The project as proposed would have no potential adverse effect on marine and terrestrial species. The site has been developed for industrial use since 1959 and it is unlikely that suitable habitat remains. California Department of Fish and Game Ecological Reserves Map does not show any ecological reserve near the site. The nearest ecological reserve to the site is Marina Islands located a few miles south of the site.

g) The project as proposed would have no potential adverse effect on any air and water resources. Local particulate standard may be temporarily exceeded onsite. If necessary, dust suppression techniques such as spraying the soil with water will be employed to reduce visible dust emissions. The proposed project does not propose any actions or activities that would require waste discharge or impair any water resources according to water quality standards. Furthermore, the groundwater in the area is not expected to be a source of drinking water and any potential drinking water sources would be from deeper aquifers that have not been contaminated by the site. There are no public drinking water supplies located within 3 miles of the Site.

Finding

Based on the explanation and supporting evidence provided above, DTSC finds that the project will have no potential for adverse effect, either individually or cumulatively on fish and wildlife, or the habitat on which it depends, as defined by section 711.2 of the Fish and Game Code

VI. DETERMINATION OF APPROPRIATE ENVIRONMENTAL DOCUMENT

On the basis of this Initial Study:

☒ I find that the proposed project COULD NOT have a significant effect on the environment. A NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED DECLARATION will be prepared.

☐ I find that the proposed project MAY HAVE a significant effect on the environment. An ENVIRONMENTAL IMPACT REPORT will be prepared.

Bill Brown	Hazardous Substances Scientist	(510) 540-3841
DTSC Project Manager Name	DTSC Project Manager Title	Phone #

DTSC Project Manager Signature — Date: 5/11/2006

Barbara Cook	Branch Chief	(510) 540-3843
DTSC Branch/Unit Chief Name	DTSC Branch/Unit Chief Title	Phone #

DTSC Branch/Unit Chief Signature — Date: 5/30/06

ATTACHMENT A

INITIAL STUDY REFERENCE LIST

For

REACTION PRODUCTS
(Project Name)

City of Richmond, General Plan, Volume One and Two. August 1994.

City of Richmond, *Richmond General Plan,* Volumes One and Two, as amended through June 1996. August 1994.

City of Richmond. Zoning Ordinance. January 1997.

Weiss Associates, *Final Removal Action Report for Reaction Products*, Source removal near RP-15. December 1998.

Bay Area Air Quality Management District (BAAQMD), BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans, revised December 1999.

Busby, Colin I., Principal, Basin Research Associates, letter to Ms. Alecia Wilmeth of Panattoni Construction, March 31, 2000.

CSS Environmental Services, Inc., Final Remedial Investigation/Baseline Risk Assessment (RI/BRA). July 2003.

CSS Environmental Services, Inc., Draft *Removal Action Workplan*. May 2006

U.S. Fish and Wild Life Service, Region 1, California Critical Habit Internet Mapping Site.

California Department of Transportation, Scenic Highway Program, California Scenic Highway Mapping System, Route 24 (http://www.dot.ca.gov/hq/LandArch/scenic_highways/scenic_hwy.htm).

City of Richmond, Zoning Ordinance, Page 30 and Zoning Map. January 1997.

California Resources Agency, Division of Land Resources Protection, Farmland Mapping and Monitoring Program (http://www.consrv.ca.gov/dlrp/index.htm).

California Resources Agency, Division of Land Resources Protection, Williamson Act Program (http://www.consrv.ca.gov/dlrp/index.htm).

Bay Area Air Quality Management District (BAAQMD), Rules and Regulations, Regulation 6. October 1998.

CSS Environmental Service, Inc., Health and Safety Plan, Section 3.0. September 2004.

Bay Area Air Quality Management District (BAAQMD), Rules and Regulations, Regulation 7. October 1998

Bay Area Air Quality Management District (BAAQMD), Rules and Regulations, Regulation 11. October 1998.

California Department of Fish & Game, CNDDB, Rarefind Report. 2003.

California Department of Conservation, Division of Mines and Geology (CDMG), Alquist-Priolo Earthquake Fault Zone Map, Richmond Quadrangle. 1982.

CDMG, Fault-Rupture Hazard Zones in California: Special Publication 42, 32p. 1997 (with 1998 Supplement)

CDMG, Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada, to be used with the 1997 Uniform Building Code. February 1998.
Campbell, K. W. and Bozorgnia, Y., 1994, Near-Source Attenuation of Peak Horizontal Acceleration From Worldwide Accelerograms Recorded From 1957 to 1993, Proceedings, fifth U.S. National Conference on Earthquake Engineering, Vol. III, Earthquake Engineering Research Institute, pp. 283-292.

City of Richmond. General Plan, Volume Two, Pages B-7, B-8, and B-9. August 1994

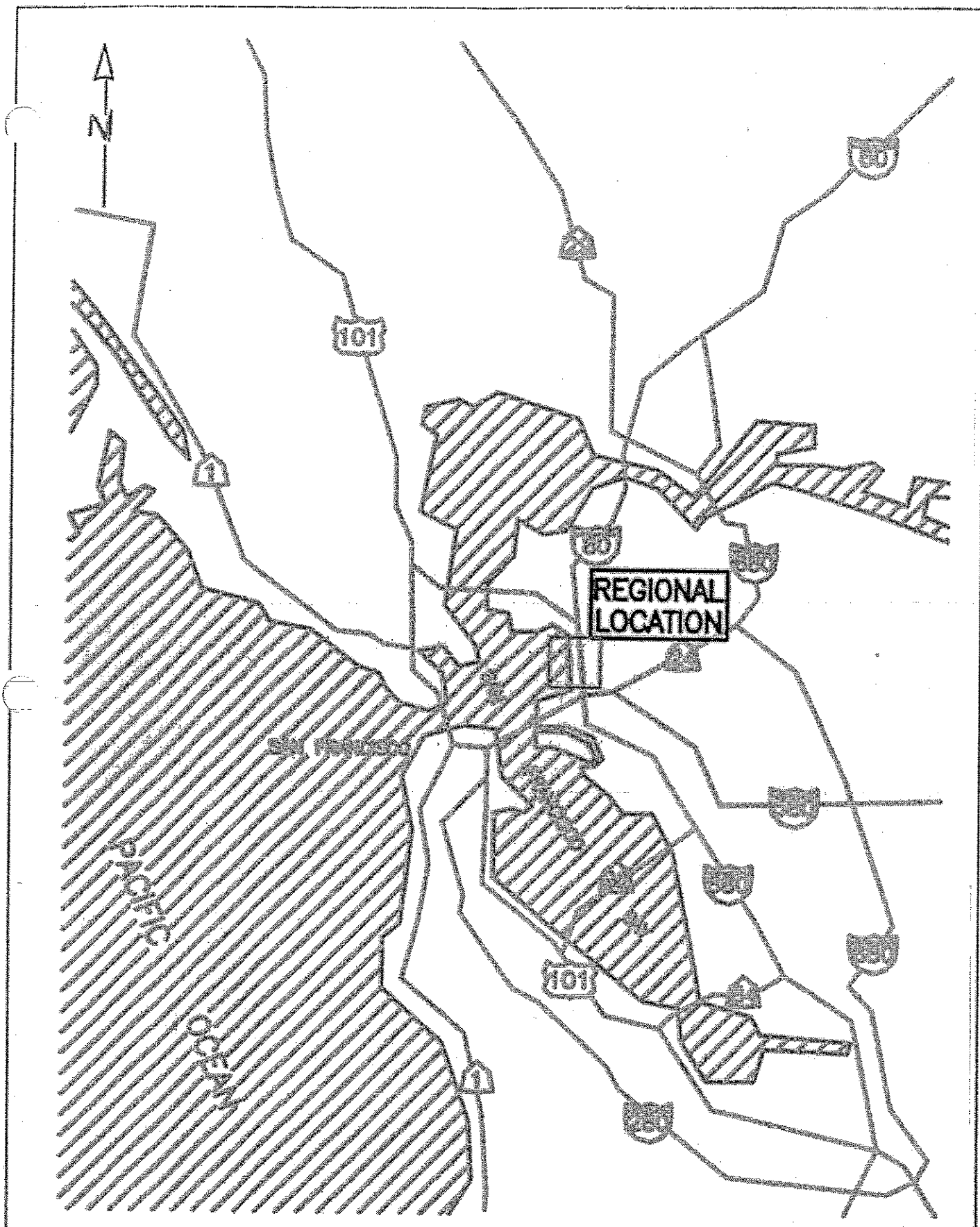
International Organization of Building Officials, Uniform Building Code. 1997.

Weiss Associates, *Final Removal Action Report for Reaction Products*, Source removal near RP-15. December 1998.

Department of Toxic Substances Control, Public Participation Plan for Reaction Plan. October 2004

http://www.dtsc.ca.gov

U.S. Department of Housing and Urban Development, Flood Insurance Rate Map, City of Richmond, Panel Number 060035 0015 B.

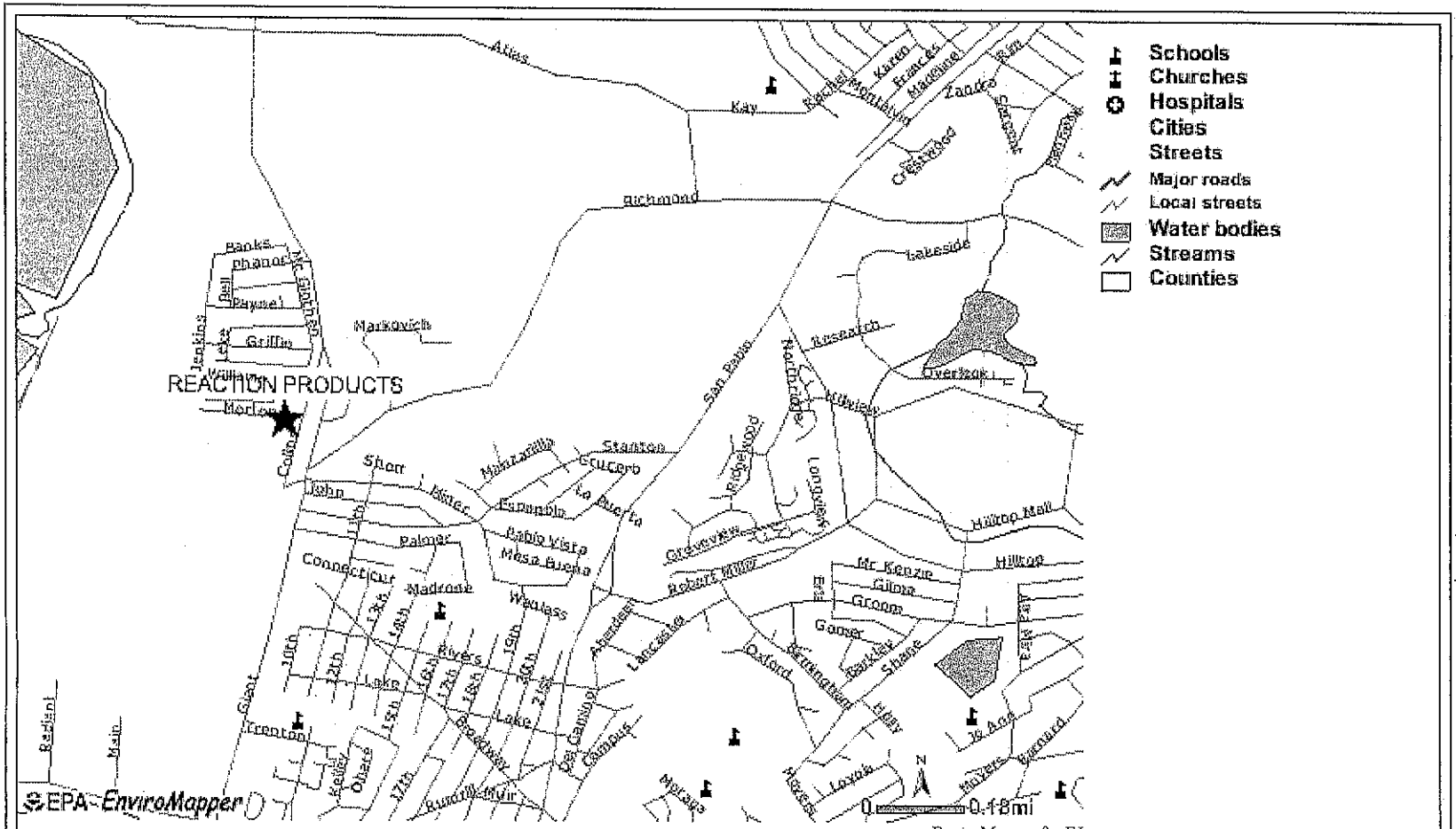


CSS ENVIRONMENTAL SERVICES, INC.

REGIONAL LOCATION MAP
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

FIGURE 1

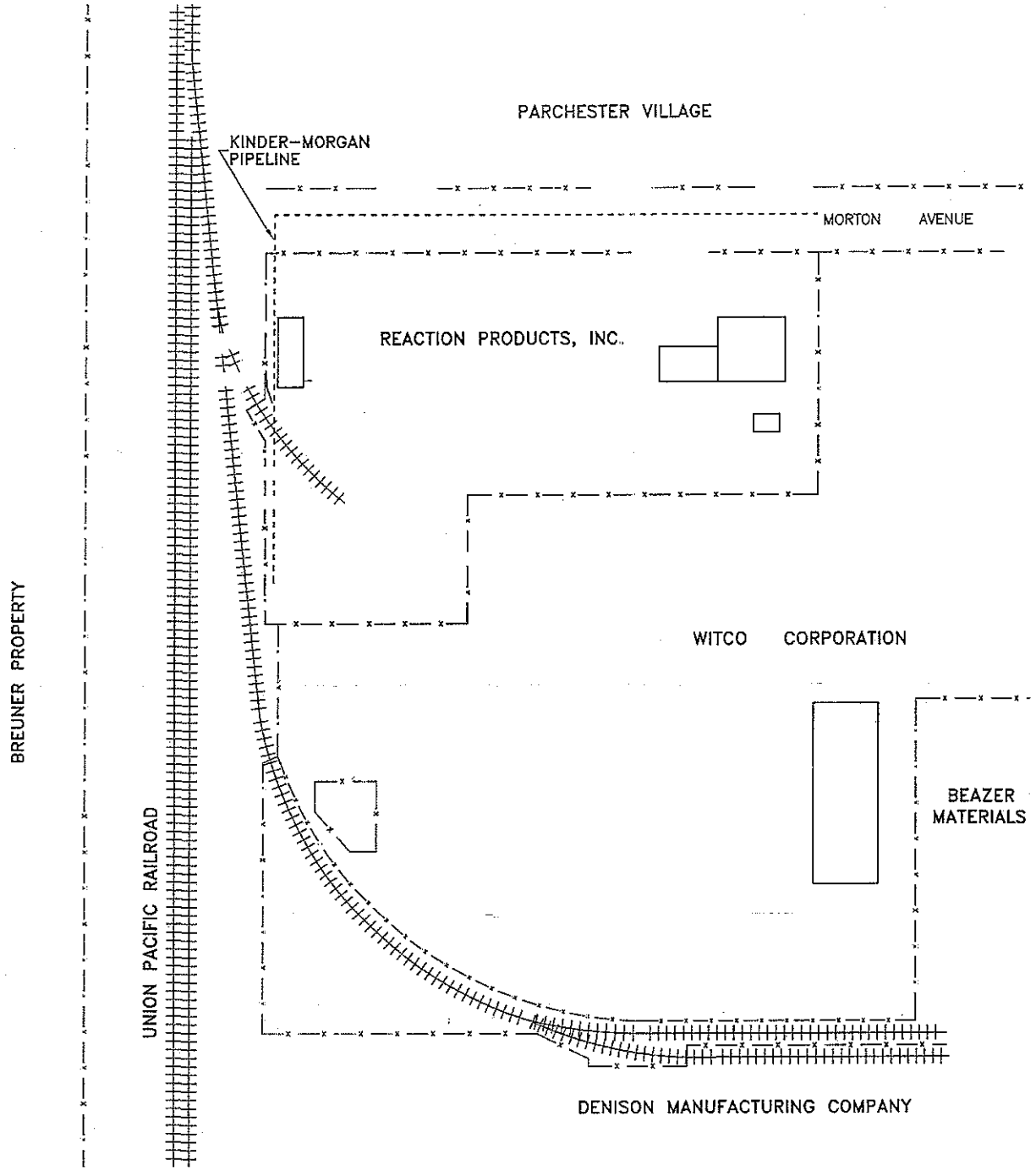
JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	04/01	6103LOC	BED	00/00

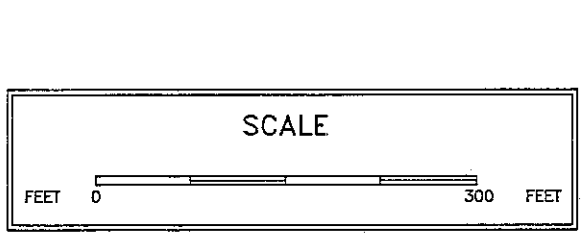


EnviroMapper for EJ

FIGURE 2 - VICINITY MAP

EPA United States Environmental Protection Agency





CSS ENVIRONMENTAL SERVICES, INC.

SITE PLAN
REACTION PRODUCTS, INC.
840 MORTON AVENUE
RICHMOND, CALIFORNIA

JOB NUMBER	DATE	DRAWING	BY	REVISED
6103	04/01	6103SITE	MJE	4/05

FIGURE 3

APPENDIX F

RESPONSIVENESS SUMMARY